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Transportation During the Next Energy Crisis:

The Special Problems of Small Urban Areas

June 1981

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Final Report
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Prepared by
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16. Abstract

The purpose of this study was to provide local government officials and other interested parties in small urban areas (less than 50,000 pop.) with special assistance in the planning and implementation of Transportation energy contingency plans. The nature of such contingencies and their impact on the transportation sector are reviewed, along with the special transportation characteristics of small urban areas (modal split, trip purpose distribution, transit structure, etc.). After establishing the nature of Federal and State contingency responsibilities, the basic local contingency plan needs are assessed, and a wide array of potential strategies are analyzed according to a consistent set of criteria (financing, timeframe, institutional problems, targeted mobility needs, special strategy-specific problems). The final chapter reviews the results of these assessments and makes a number of conclusions and recommendations. A special 13-page guidebook on contingency planning, following a question- and answer format, was also developed and is included in the appendix.

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CHAPTER I

INTRODUCTION

1. Background

The energy supply problems that occurred in this country in 1973-74 and 1979 clearly demonstrated to all sectors of society that: (a) such shortages can easily occur and are very likely to happen again, and (b) the sudden reduction in the supply of something as vital as petroleum products can produce serious economic and social problems. This is particularly true in a nation as petroleum-dependent as the United States, which uses twice as much energy on a per capita basis than West Germany, France, and England, and almost three times as much as Japan (1). As this nation gradually became the net petroleum importer that these other countries have always been, and began to feel the inflationary impact of the high energy costs and outflow of dollars to petroleum exporting countries, the conservation efforts needed to reduce this extravagant use of energy (i.e., petroleum) have gradually begun.

The advent of this new energy consciousness, further enforced by the rapid escalation of petroleum costs, has meant that all users of energy would have to look for ways to conserve. Figures I.1 and I.2 demonstrate how all forms of energy, and petroleum in particular, are used in this country by the major sectors of the economy, while Figure I.3 shows how rapidly petroleum energy costs have increased in recent years. The transportation sector's importance in this context is clearly seen by its large share of the petroleum demand, a fact that is to be expected for a country with the world's highest per capita automobile ownership rate, relatively low utilization of rail freight, and extensive domestic airline activity. Because of these facts, the transportation sector (and therefore the nation as a whole) is higly susceptable to petroleum supply problems. Conversion to alternative fuels as a response to such shortages is generally impossible, either because it is technically impossible (e.g., direct use of coal in cars) or not possible in the short-run (e.g., widespread availability of alcohol fuels).

It is clear that actions must be taken by both private and public sectors to help resolve these problems or at least reduce their severity in two manners:

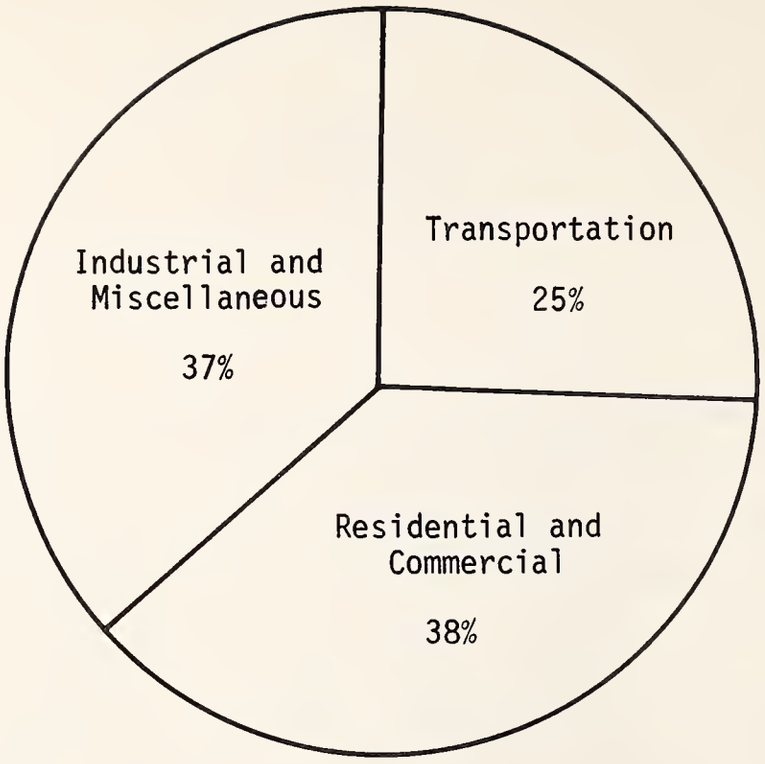

FIGURE I.1
DISTRIBUTION OF ENERGY USE
by SECTOR (SOURCE: 2)

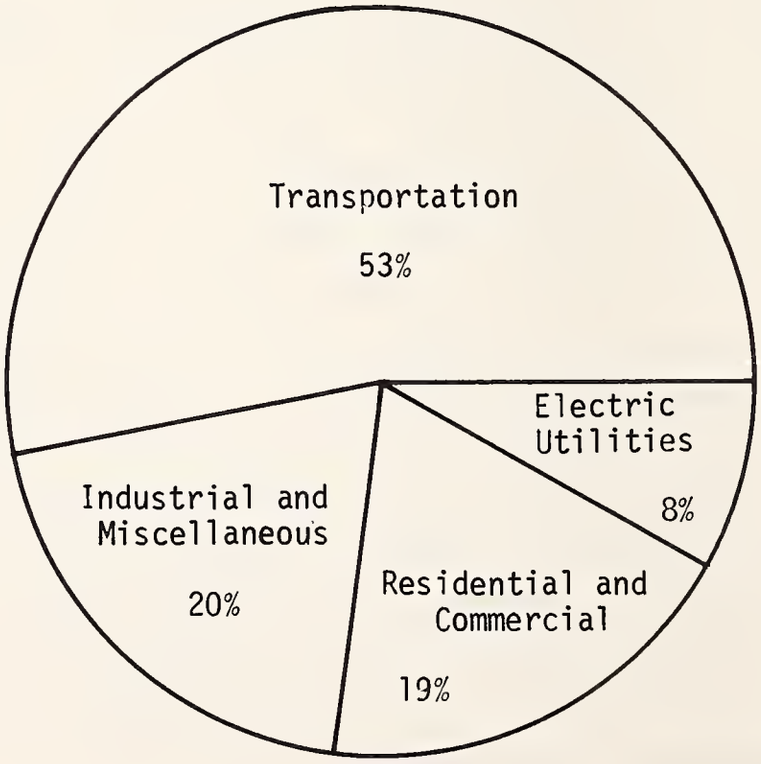

FIGURE I.2
DISTRIBUTION OF PETROLEUM USE BY SECTOR
(SOURCE: 2)

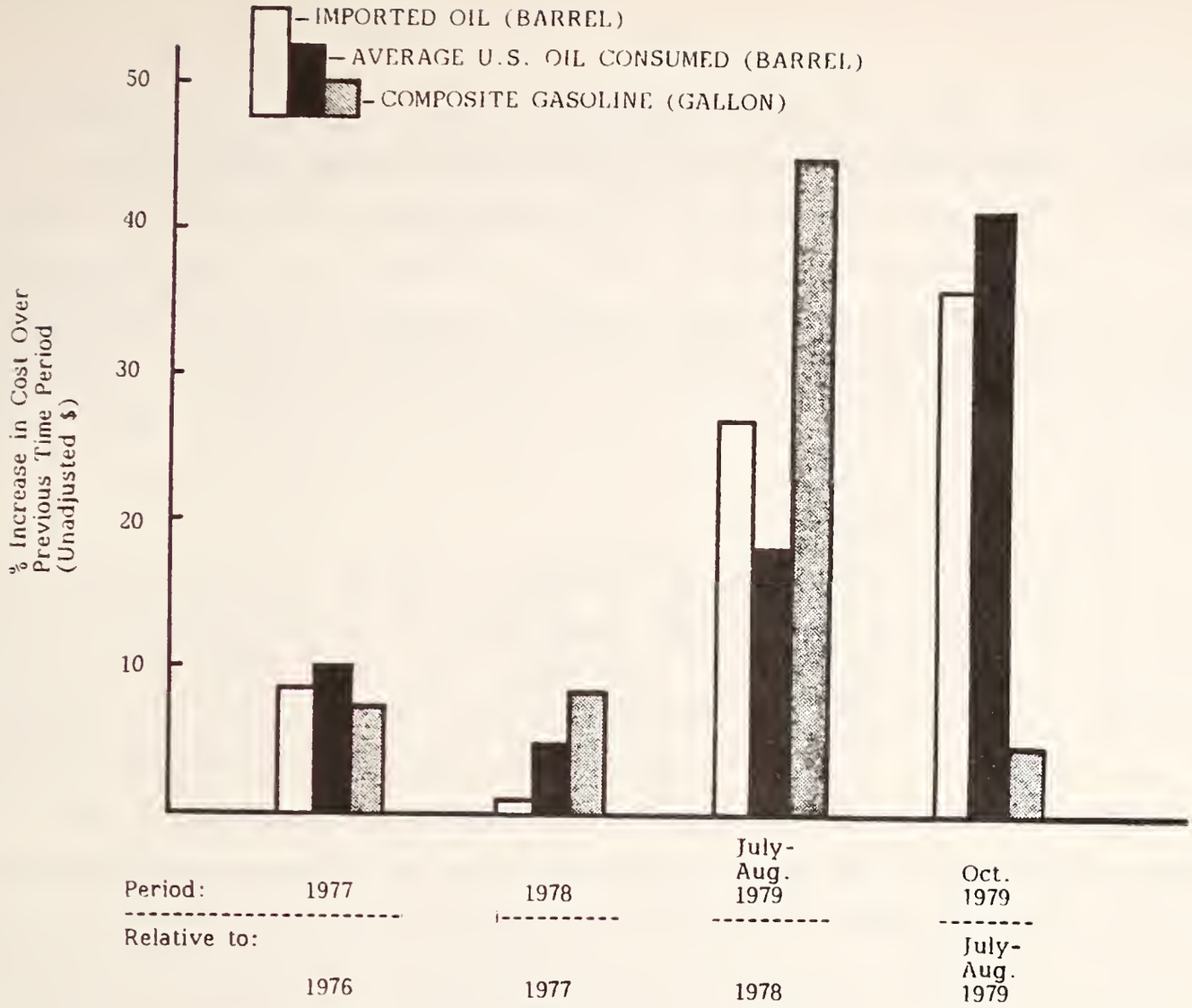

FIGURE I.3
PERCENT INCREASES IN PETROLEUM PRICES
FROM ONE PERIOD TO ANOTHER
(SOURCE: 3)

- rapidly work toward a reduction in the use of petroleum through more efficient conversion methods, conservation programs, and the like; and
- develop plans that can help the nation cope with energy emergencies when they do occur.

Both of these factors are crucially important and obviously linked; i.e., the greater the conservation efforts, the lower the probability of a shortfall in the future. However, this report focuses on the specific issue of transportation contingency plans for petroleum shortages, and particularly on the need for and methods of developing such plans for small urban areas. These areas, (loosely defined as those with 50,000 population or less) are particularly vulnerable to energy shortages, due to their: (a) almost complete dependence on private automobiles for mobility; (b) lack of adequate public transportation; and (espe-

cially for more recently developed areas) (c) fairly low commercial or residential densities, which make the use of high-occupancy modes more difficult. In addition, it was felt that much of the administrative and planning attention given to such contingency plans in recent years has been focused on larger urban areas. Strategies and policies developed in such areas are often inappropriate or simply impossible to implement in a smaller urban setting. Plans and methodologies are therefore needed that are specifically geared toward such smaller cities.

2. Purpose of the Study

The purpose of this study is to develop methods to assist small urban areas in the planning, design and implementation of transportation energy contingency plans for their areas. The general nature of travel in such areas is identified, and categorized by the origin-destination patterns, trip purposes and modes used. The types of mobility problems caused by petroleum shortfalls are discussed, along with the range of existing government responses to such shortages. Various transportation strategies that could help to deal with such mobility problems in these areas are thoroughly reviewed, with special attention given to such factors as the cost and timeframe for implementation, required governmental action and financing, and appropriate administrative framework.

Conclusions and recommendations are then made for the role of local governments and the private sector in developing and implementing such plans. It is fully realized in these analyses that the types of small urban areas involved are generally unfamiliar with many of the factors involved in detailed transportation planning, and lack the available staff, skills, and funding to follow overly technical guidelines. The research team has held meetings with representatives of local governments as well as private business leaders to assess: (a) how these groups reacted in the past gasoline crises; (b) what types of plans and strategies are potentially beneficial and implementable; and, (c) who would handle the development and implementation of such plans.

CHAPTER II

TRAVEL CHARACTERISTICS OF SMALL URBAN AREAS

1. Introduction

In many ways the manner in which the transportation of goods and persons is handled in smaller urban areas in the United States typifies the general transportation situation in the country as a whole. The almost total dependence on the private automible, the lack of thorough, effective mass transit alternatives, and the limited use of rail freight in such areas is a pattern that is departed from only in a relatively small number of large, central cities (e.g., New York City, Boston, Chicago, San Francisco, etc.). These characteristics clearly make them highly vulnerable to a severe petroleum (i.e., gasoline) shortage, as the ability of their residents and business to switch to reasonably viable travel alternatives is very limited.

There are, however, a number of methods that can be used to significantly reduce the impact of an energy contingency. Even those areas that lack experience with or institutions to handle transit planning and operations or other government-based transportation operations still have a viable array of options available to them. Many of these actions may occur spontaneously through private initiative induced by simple common sense and the need for economic and social survival. Households, for example, will cut back on unnecessary travel, try to "link" their trips (e.g., shop near their work sites to combine the shopping trip with the journey to work), and make similar discretionary travel decisions that can end up as the main sources of any transportation energy reduction (4). Employers will independently foster increased ridesharing programs among their employees, whether or not government programs to increase carpooling and vanpooling exist in the area. In fact, some observers of the handling of the mid-1979 energy crisis felt that in such circumstances private citizens and firms "...find their own solutions to the (energy) problem with a minimal amount of assistance from government" (5). Based specifically on the observations of the energy crisis in the hard hit areas in and around Los Angeles, it was felt that governments have: (a) failed to identify and realize that the private sector can solve most of its own energy contingency problems, and (b) created a series of institutional, political, or social barriers

that kept local governments from being an effective force in such contingency periods. In smaller urban areas, where the profile of local government activities is traditionally rather low, these points would appear to be even more valid.

The role of local governments in such situations, and in transportation planning and operations in general, is relatively small. Recent discussions by members of the research team with local officials in selected areas in New York State have shown that they were typically caught in a "wait and see" position during the mid-1979 shortage. Private citizens increased carpooling and their use of available transit (usually private and/or controlled by regional or county governments), and gasoline station lines grew at various times during this period. The major factors that reduced these problems--e.g., minimum purchase rules, odd-even plans, --were handled at the State level. Considering the frequently-voiced belief that such shortages will be both few and short in duration, local governments in smaller urban and suburban areas have not allocated much resources to energy contingency planning efforts. The priority for these expenditures appears fairly low, and ability and resources of these governments to do anything about such problems anyway are viewed as limited at best. This does not mean that local government agencies in such areas cannot or should not do anything in this context. Rather, any such efforts need to be selected very carefully and with a full realization that the overall level of such efforts may be fairly limited in scope.

2. The Nature of Travel in Small Urban/Suburban Areas

The main characteristics of such areas that make the range of shared-ride plans offered in contingencies difficult is the dispersed nature of the land use patterns in these settings. The structure of the traditional central city is one that has travelers (especially for the work trip) going from relatively dense residential areas to a limited number of central business districts (CBDs). Historically, the available array of transportation modes expanded, enabling people to live further from their work sites, the effective size of the urban areas grew, as Figure II.1 demonstrates. Contrary to popular opinion, while the automobile and supporting highways made possible the largest absolute increase in the effective size of urban areas, it was transit modes themselves that actually created the accelerated spread of population and related land uses.

The post-World War II automobile-based movement toward lower urban densities is therefore a simple continuation of a trend that has its roots in the mid-19th century.

The Nationwide Personal Transportation Study (7) indicated the distribution of personal trips by mode that is shown in Table II.1. The data show the well known dominance of the private automobile (at an average auto occupancy of roughly 1.6 persons/vehicle) and the very small role that transit modes play.

TABLE II.1

DISTRIBUTION OF PERSON TRIPS BY MODE OF TRAVEL

MODE	PERCENT OF TOTAL
Private Auto	
Driver	51%
Passenger	34%
Other Private Vehicles	6%
School Bus	5%
Public Transit[1]	4%
TOTAL	100%

[1]Includes taxis, subway, elevated, train and airplane
Source: (7).

In addition, the conventional scheduled transit modes are virtually absent from most smaller urban areas, particularly if they are not within the influence of a larger urban concentration that have public transit links (mainly for work trips) with surrounding communities. The lower residential and commercial density in smaller urban and suburban areas also means that the automobile trip rate and vehicle miles per household decreases with urban area size, as Table II.2 shows. The lower rates for the larger cities is due to: (a) the greater availability of mass transit services; (b) the lower automobile ownership rates

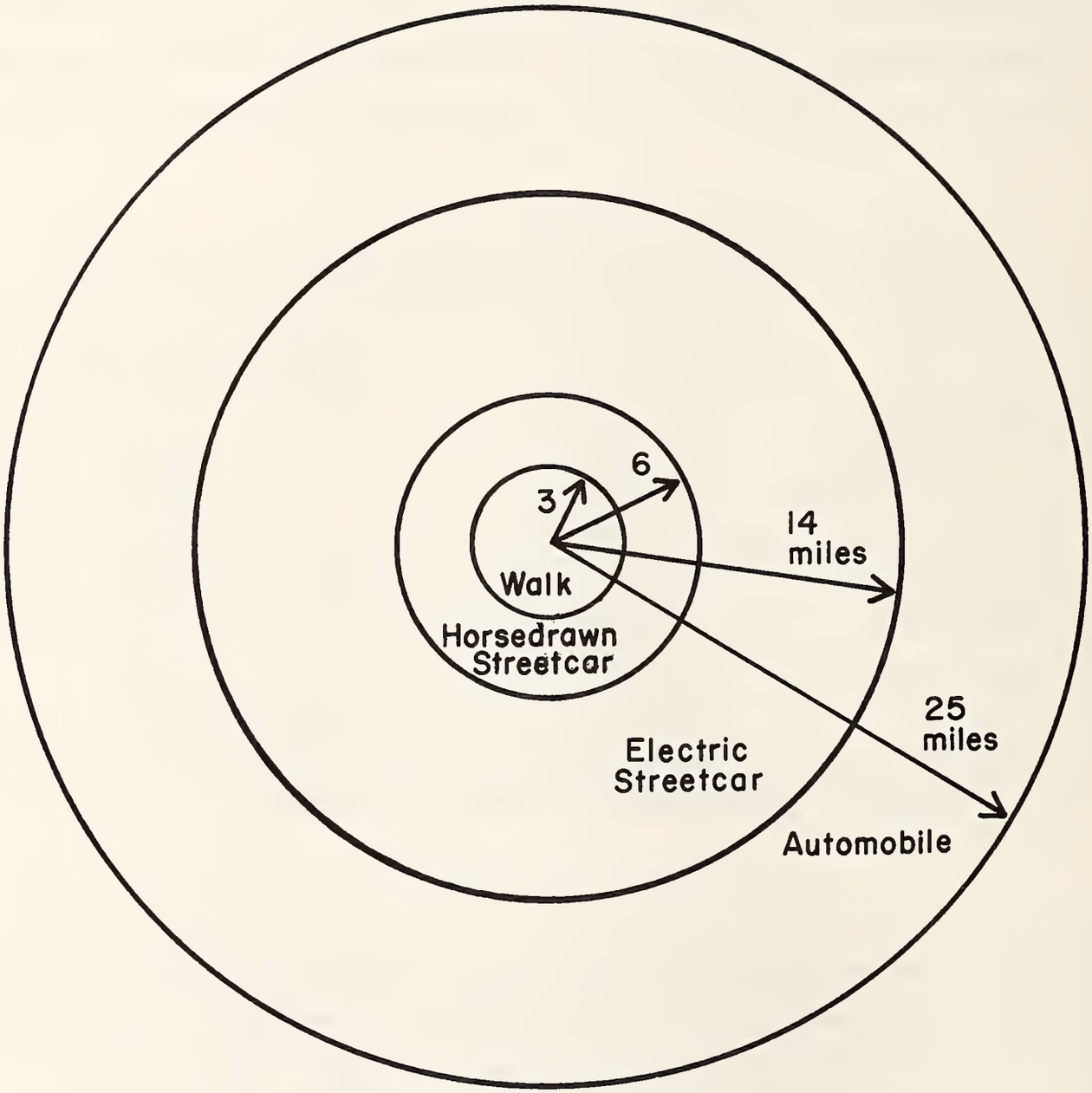

FIGURE II.1
URBAN AREA ACCESSED ON A ONE HOUR TRAVEL BUDGET
(SOURCE: 6)

TABLE II.2

PASSENGER CAR TRIP RATE AND VMT BY HOUSEHOLDS BY SIZE OF INCORPORATED AREAS

	TRIP RATE/HOUSEHOLD		VMT PER HOUSEHOLD	
POPULATION SIZE	ANNUAL	DAILY	ANNUAL	DAILY
5,000 - 24,999	1,870	5.1	14,696	40.2
25,000 - 49,999	1,479	4.1	11,601	31.8
50,000 - 99,999	1,344	3.7	10,840	29.7
100,000 - 999,999	1,226	3.4	9,399	25.8
1,000,000 & over	700	1.9	8,210	22.5

Source: (8)

per household in such cities; and (c) the higher residential-commercial densities that make possible more pedestrian based trips (e.g., walking to cleaners, grocery store, other retail outlets, etc.). The trend for a variety of trip purposes is clearly demonstrated in Figure II.2. In all areas this journey to work is the single largest trip generator, accounting for 32 percent of the automobile trips and 33 percent of the vehicle miles of travel (VMT). The distribution of VMT by trip purpose for the "small urban area" group (defined here as having a population of 25,000-50,000) is outlined in Table II.3. These and earlier data demonstrate, therefore, that: (a) smaller urban areas are much more automobile - and petroleum-dependent than their larger urban counterparts; and (b) major portions of the average households automobile travel could clearly be labelled "discretionary" and therefore able to be reduced substantially during relatively short-duration energy contingencies without significant social or economic harm.

3. The Concept of a "Typical Small City"

The previous discussions briefly outlined the type of personal transportation conditions that exist in the typical small urban setting. While it has been mentioned that cities in the roughly 50,000 population size are the targeted group for this report, this is not meant to imply that there is such a thing as a "typical small city." Some are older cities that possibly played a more significant regional economic and social role in the past but have lost population and

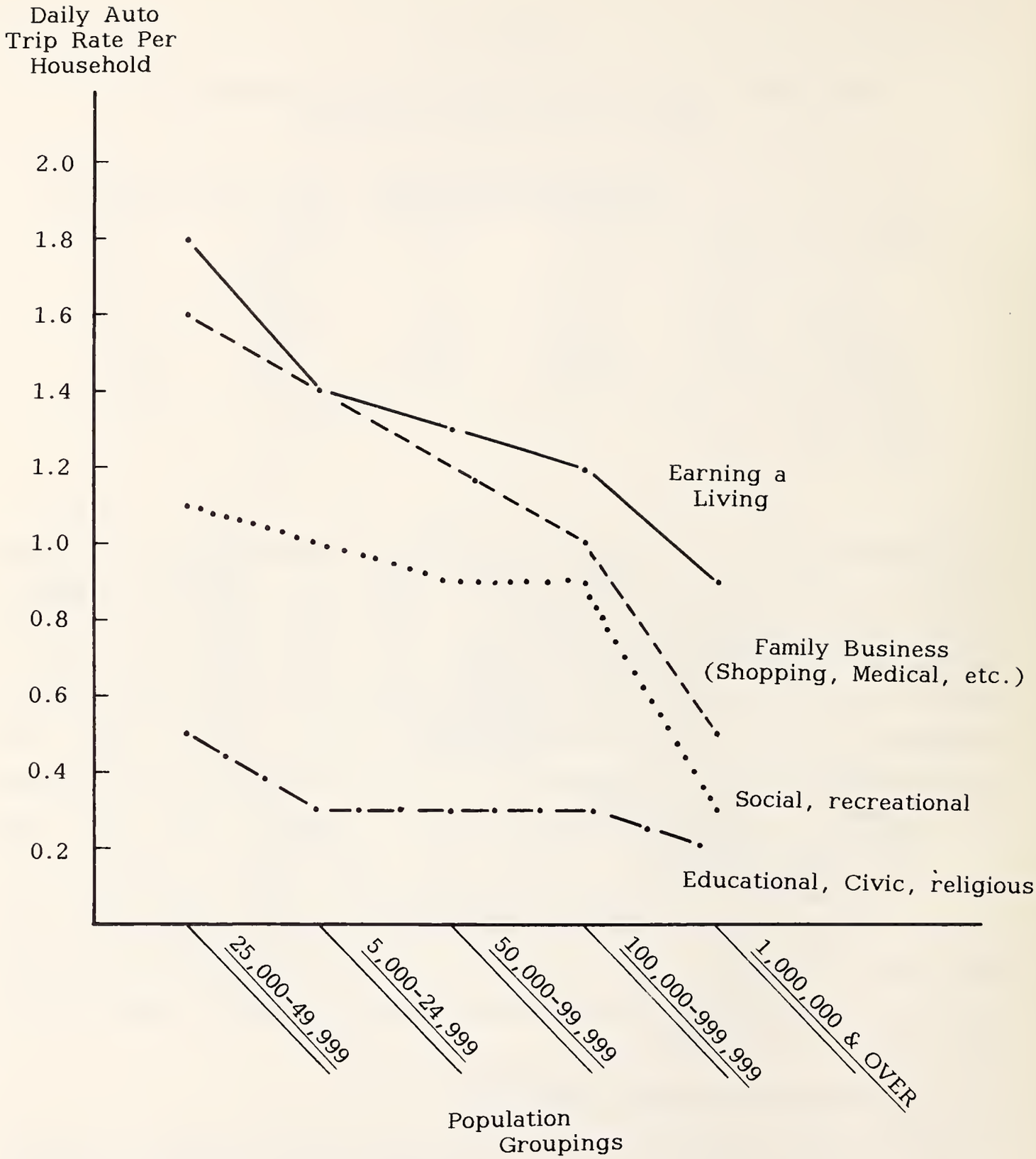

FIGURE II.2
DAILY AUTOMOBILE TRIP RATES BY HOUSEHOLD
BY SIZE OF URBAN AREA
(SOURCE: 8)

TABLE II.3

DISTRIBUTION OF AUTOMOBILE VMT AND AVERAGE TRIP LENGTH BY TRIP PURPOSE IN SMALL CITIES (<50,000)

TRIP PURPOSE	PERCENT OF TOTAL VMT	AVERAGE TRIP LENGTH (MILES)
Earning a Living		
How to work	29.9%	
Related Business	10.5	
Subtotal	(40.4)	9.2
Family Business		
Shopping	6.6	
Medical/Dental	0.9	
Other	11.3	
Subtotal	(18.8)	4.5
Educational, Civic, Religious	4.1	3.7
Social and Recreational		
Visiting Friends, Relatives	15.1	
Pleasure Driving	4.6	
Vacations	0.5	
Other	16.0	
Subtotal	(36.2)	12.2
Other Purposes	0.5	
TOTAL	100%	7.8

Source: (9)

employment in recent decades, while others are rapidly growing suburbs that have recently been forced out of "village" status by the same types of relocations but in the reverse direction. This is particularly true in the Northeast, as there are a large number of older urban centers that have fallen considerably from their relative stature of the late 19th or early 20th century. Others have suffered from the post-World War II shift to lower density suburban areas. Figure II.3 outlines how the nations metropolitan vs. non-metropolitan areas changed over the 1960-77 period in terms of population, and how the different

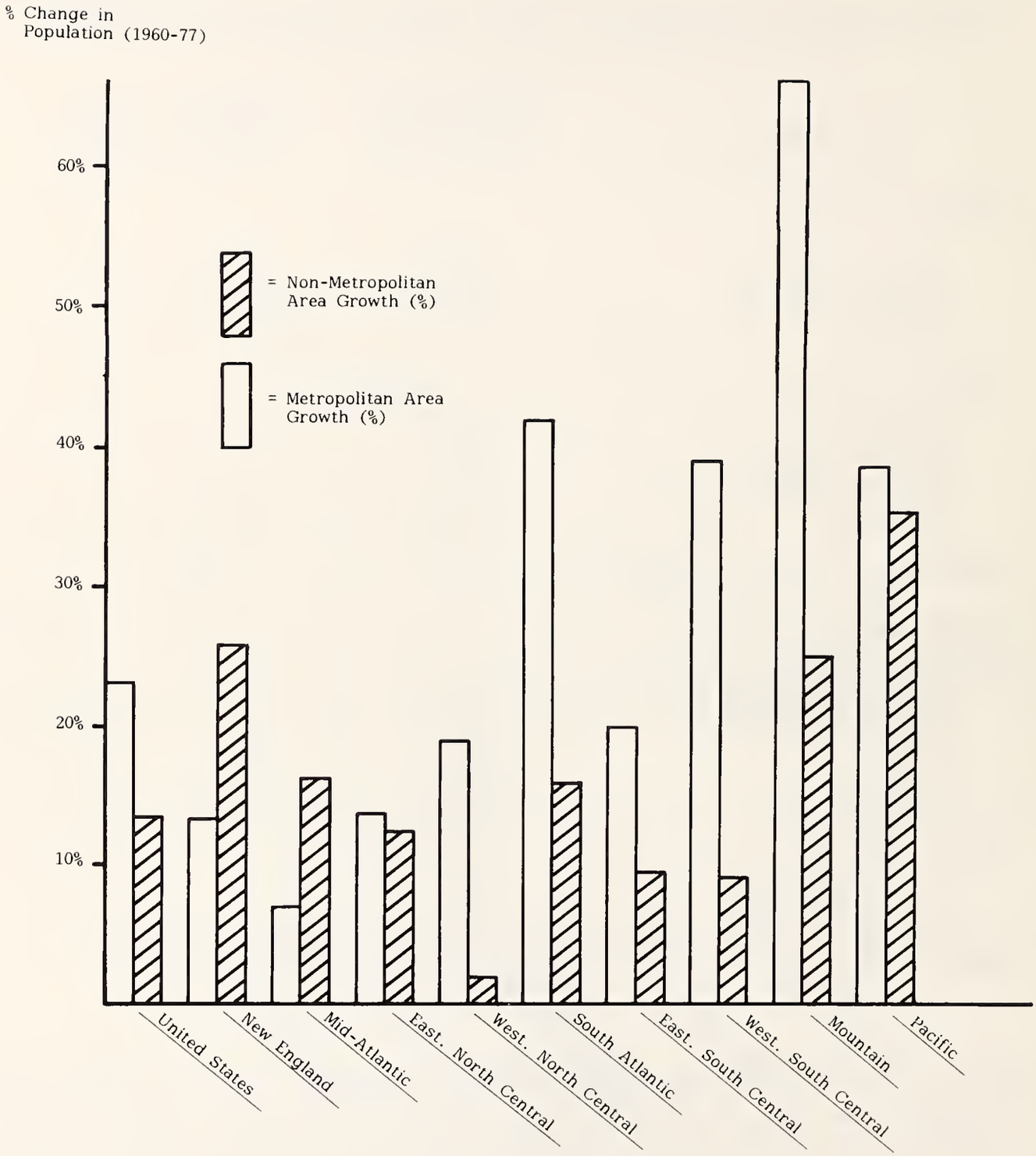

FIGURE II.3
PERCENTAGE CHANGE IN METROPOLITAN AND
NON-METROPOLITAN POPULATION FOR THE U.S.
AND NINE SUB-REGIONS
(SOURCE: 14)

sections of the country were effected. The data clearly demonstrate that the "Sunbelt" areas grew at a much faster rate than the "Frostbelt" areas of the Northeast. In addition, while for the nation as a whole growth in non-metropolitan areas was somewhat less than in metropolitan areas, a number of other patterns emerge:

- those areas with relatively slow growth had more growth in non-metropolitan areas (e.g., Northeast, Mid-Atlantic); and
- the 1970-77 period was considerably different than the 1960-77 period; metropolitan areas grew by 17.1% and 5.5% in 1960-70 and 1970-77 respectively, while non-metropolitan areas' equivalent figures were 4.2% and 9.2%.

Similarly, while large metropolitan areas ($\geq$ 1.5 million) grew by around 2.4 percent over the 1970-77 period, smaller metropolitan and non-metropolitan areas grew by 9.2 percent and 9.0 percent respectively. Growth was occurring throughout this period in urban areas, but a larger portion of it has occurred in smaller urban and rural areas. In summary, from a transportation perspective, a gradually increasing percentage of the nation's population was located in lower-density areas that are rather ineffectively served by conventional transit modes. Table II.3 demonstrate the actual disparity that exists among areas that are presently relatively equal in size. Although each of these areas is relatively equal in terms of population, some (e.g. New Brunswick, N.J.; Fayette-

TABLE II.4

POPULATION AND RELATED DATA ON SELECTED CITIES IN NORTH CAROLINA, NEW YORK AND NEW JERSEY

	POPULATION PROFILE			PER CAPITA	POPULATION
CITY	% Δ 1975	% Δ 1970-75	% Δ 1960-70	INCOME (1974)	DENSITY (PERS/MI^2)
Binghamton, NY	60,66	-5.4%	-15.6%	$4,207	5,515
Atlantic City, NJ	43,969	-8.1%	-19.6%	3,672	3,546
Bloomfield, NJ	52,162	+0.3%	+0.3%	5,688	9,660
New Brunswick, NJ	47,420	+13.2%	+4.3%	4,267	8,468
Vineland, NJ	53,637	+13.2%	+25.8%	4,202	772
Mount Vernon, NY	67,687	7.0%	-4.3%	5,138	15,741
Fayetteville, NC	65,915	+17.0%	+19.6%	4,166	2,321
Wilmington, NC	53,818	+16.6%	+4.9%	4,074	2,551

Source: (10)

ville, N.C.) are clearly in the midst of an economic upswing, while others (Atlantic City, N.J.; Binghamton, N.Y.) have been experiencing a consistent downward trend since 1960. The population density values also show a wide disparity, which would tend to reflect directly on the viability of various transportation strategies to increase the use of high-occupancy vehicles (paratransit and transit).

This brief statistical presentation is clearly not meant to address the whole issue of urban types, but rather to emphasize the fact that no single strategy or set of strategies can effectively be transferred among urban areas, even though statistically or otherwise they appear to be similar in nature. The particular political and social characteristics of a city, and more importantly its relationship to surrounding communities are of special interest. This report has taken as its principal focus those smaller urban centers that are relatively independent of other, larger urban areas, and are the central social and economic focus of their particular region. Roughly 28 percent of the workforce of Mount Vernon, N.Y., for example, worked in New York City in 1970, while roughly 37 percent worked within its own city limits. In contrast, approximately 70 percent of Binghamton, N.Y.'s 1970 workforce was employed within its own city, while almost 30 percent of those workers living in surrounding communities worked in Binghamton (11). It is toward the Binghamton-type city that this report is aimed, with the understanding that such areas:

- generally have very little conventional transit service (although many had such services in the past); and,
- are not within the functional influence of a regional transportation structure dominated by a larger urban center (e.g., Mount Vernon's transit links to New York City via the Metropolitan Transportation Authority); and, therefore, have relatively little experience in making extensive transportation plans dealing with non-automobile modes.

Every attempt has been made to be sensitive to the particular perspective of such areas. Plans or strategies that assume the availability of a wide range of in-house personnel skills and resources are avoided, with greater emphasis placed on those that: (a) are relatively low-cost; (b) require little or no addition of new equipment, staff capabilities, etc.; and, (c) are dependent to a

great extent on the cooperative participation of the private sector (companies, associations, private citizens, etc.). In the next chapter, the basic nature of the transportation problems that energy contingencies create, and the types of responses they have engendered in the past, are discussed. This will establish a basis for the review of potential contingency strategies that is presented in later chapters.

CHAPTER III

PROBLEMS CREATED BY ENERGY CONTINGENCY

1. Introduction

During an energy crisis, the availability and distribution of fuel, generally taken for granted, suddenly become very serious problems. The price of fuel increases very sharply, and even for those who are willing or able to pay the higher price, simply obtaining some of the available fuel is no easy matter. Long gas lines developed in 1974 and 1979 in many areas across the country, with customers having to get up early in the morning just to get the opportunity for a place in line. Significant amounts of fuel are wasted in such lines, along with the considerable investment in time and occasional outbreaks of temper and even violence.

Over the past six years the federal government has come up with an allocation program, and a variety of gasoline rationing programs has also been suggested. Both of these areas have been sources of heated debate within Congress and the transportation community. In addition, such plans clearly would not eliminate a shortage, and still leave private citizens, companies, and government agencies with the severe problem of continuing to function with lesser amounts of fuel.

In the following sections the types of mobility problems that are likely to be experienced in small urban areas are identified and discussed. The nature and status of the federal allocation program and related plans at the state level are briefly presented here in terms of their likely impact on the range of mobility problems these areas would face. A more thorough discussion of these items is left to a more suitable forum (e.g., 12, 13). Finally the "net" mobility concerns--i.e., those that remain after likely federal and state actions have occurred--are addressed to demonstrate the types of problems and challenges that will have to be handled at the local level in the event of such petroleum shortages.

2. Federal Allocation Procedures

The first crude oil allocation program was instituted in January, 1974 in order to alleviate supply shortages of crude oil, residual

fuel oil and refined petroleum products. There were two major elements in the Federal Energy Office's (FEO) original crude oil allocation program:

- The Supplier/Purchaser Rule. This regulation froze in place all supplier/purchaser relationships for domestic crude oil that existed on December 1, 1973.

- The Crude Oil Buy/Sell Program. This mandated certain sales of crude oil from one refiner to another in order that each refiner could have access to available fuel supplies at the national average supply-to-capacity ratio for all refiners. This measure would therefore spread all oil shortages "across-the-board" among all refiners.

In May 1974 after the OPEC oil embargo was lifted, the FEO substantially revised the mandatory crude oil allocation program to remove the disincentives for increased production and importation of crude oil which existed under the original program and to eliminate allocatons between major oil companies. As more normal supply conditions returned to the petroleum industry, the mandatory crude oil allocation program was also re-evaluated and further modified.

In January, 1979, further changes were made to the Allocation Regulations. There would be two categories for allocation priorities. The sectors that would receive 100 percent of their current requirements and not be subject to a so-called "allocation fraction" were agriculture and defense. The second category included three sub-categories.

- Sectors that would receive 100 percent of current requirements, but partially reduced by the application of an allocation fraction:

  + Emergency service
  + Energy production
  + Sanitation services
  + Passenger transportation services
  + Telecommunication services
  + Cargo, freight and mail hauling

- Sectors that would receive 100 percent of base period petroleum product demand (as reduced):

  + Chemical processing
  + Petro chemical feedstock use
  + Industrial use

+ Synthetic natural gas plant feedstock use
+ Blending and compounding of lubricants

- Sectors that would receive 90 percent of base period volume (as reduced):

  + Gasoline blending and manufacturing
  + All other uses

3. Status of Stand-by Federal Rationing Program

The U.S. Department of Energy proposed standby gasoline rationing plans, in June 1978 and December 1979. Congress finally approved the program in 1980, which essentially empowers the President to call for motor fuel rationing if a 20 percent shortfall exists for at least 30 days. The plan, which essentially would superceded the Federal allocation system, sets aside 1 percent of the total fuel for agricultural purposes, and allocates the remaining 99 percent to individual states based on the relative volume of fuel used in each state. The States can set aside 5 percent for special hardship situations, and various percentages of the remaining fuel are then set aside for selected groups (transit systems, police, fire and other emergency services, etc.). The balance of the supplies are then allocated via rationing coupons to invididual vehicle owners. Those owners of registered vehicles that end up using less than his/her monthly allotment of fuel, could sell the surplus coupons through a "white market" mechanism to those wanting more than their allocation. As supplies become more or less scarce, the total number of coupons can be increased or decreased accordingly.

U.S. DOE is presently in the early stages of a 12-15 month pre-implementation phase of the rationing plan, after which it will be ready for implementation in a relatively short time frame (presently estimated at anywhere from 1-3 months). However, the new administration has expressed strong reservations about the need for such a program (U.S. control of shortages through basic market forces), and its future is presently in doubt.

4. Programs for Lesser Shortfalls

The minimum 20 percent shortfall for the Federal rationing system essentially recognizes the extensive and difficult efforts by the private and public sector efforts necessary to implement and conform with this type of direct

market control strategy that for lesser petroleum supply problems a variety of other Federal, State and local government actions, as well as (most importantly) those of private firms and citizens will help to effectively close the supply gap while minimizing its disruptive effects.

State governments are generally assumed to play the major role in the management of supply problems associated with these lesser contingencies, principally through their ability to control panic selling patterns and the associated "moving storage" problem. Assume, for example, that a state with 7 million registered vehicles had its amount of available gasoline stocks fall by 10 percent. If a typical weekly demand were 10 gallons per vehicle (with the average car having a 15 gallon tank usually half full) the fleet would consume roughly 10 million gallons per day (7 million vehicles × 10 gallons/week ÷ 7 days/week). The "moving storage" in these vehicles would equal approximately 52.3 million gallons (7 million × 7.5 gallons/tank)--the equivalent of over a 5 day supply for the entire state. However, a panic atmosphere can lead drivers to "top off" their tanks. If drivers add, say, 3 gallons per day to maintain their in-tank supplies, this would mean a 40 percent increase in the moving storage, making the 10 percent shortfall appear much larger. Essentially, even though there was an obvious shortage of fuel, panic-fed demand for fuel actually increased.

The principal methods available to states to control fuel sales include minimum purchase rules, odd-even license plate sales days, control over station hours, and selected variations on these measures. The odd-even and minimum purchase approaches were generally felt to be the most effective during the 1974 and 1979 gasoline shortages, and appeared to have fairly good public support.

States are presently involved in the preparation of state energy conservation and contingency plans, including the following major elements:

- how they plan to handle their allocation role, under existing Federal regulations and under more severe, rationing conditions;
- how they intend to induce their residents and business and government sectors to conserve fuel; and

- what specific step will be taken to resolve other contingency-related problems (restrict vehicle use, increase transit aid, etc.)

Many of these efforts essentially deal with the financing, coordination, and general support for contingency actions that are actually administered and directly controlled at the regional/local level. This coordination aspect of state level activity may therefore be one of the most important, as it helps to assure coverage of all areas and sections of the state, and that the regional efforts "total up" to the necessary statewide energy goals (e.g., the state's overall gasoline allocation). Much of the financing efforts will focus on identifying the sources of contingency-related funds assumed in the strategies of local transit agencies and county and local governments. The key question is whether various funds exist on a stand-by-basis at the levels assumed in such strategies (e.g., an x% increase in state transit operating support for additional contingency transit operations). While the state departments of transportation and energy or their equivalents will be the ones most closely associated with these plans, those dealing with such issues as regulatory control (public service commissions), relations with labor groups or business section and associations (departments of labor or commerce) or overall state coordination and overview functions (office of management and budget) could clearly play important roles in this context.

5. Local Government Challenges Created by Shortfall

The basic problem presented by a motor fuel shortfall is handled to a great extent by Federal (allocation) and state (minimum purchase/ odd-even) actions. However, after the lower supply situation has been somewhat stabilized (i.e., panic buying has been controlled), citizens, businesses and government agencies must quickly respond to and cope with these new conditions. In the small urban areas that are the focus of this report, the situation is one where a highly auto-dependent society must come up with alternative methods of travel (transit, paratransit) that are relatively unfamiliar to the community. Citizens and the commercial sector are not accustomed to using or depending on them, and the government agencies have never had to plan or implement schemes that would make such modes available to the public (15). These local government officials must therefore go through the following planning stages to design and make ready a reasonable contingency response:

1. Establish Present Travel Patterns -- what trips are being made for various purposes by origin-destination, time of day/week, etc?

2. Determine Present Modal Split -- how are trips identified under 1 above being handled?

3. Estimate Contingency Impact Patterns -- how will the travelers and modes in the community be affected by the shortages, and where will the mobility restrictions be the greatest?

4. Structure Appropriate Actions -- what feasible actions need to be taken by these local government agencies to address the impact outlined under 3 above, who will be responsible for their planning and implementation, and how will they be financed?

The local officials in these smaller communities will be facing a personal travel demand market that is distributed by trip purpose as shown in Figure III.1. However, the quality of the specific travel data for an individual city may be poor (or not exist at all) in terms of origin-destination patterns, trip distributions by purpose, time of day, and mode and similar information. Most of the understanding of travel patterns by local government officials will typically be based on the location and size of major trip generators (e.g., employers, shopping malls, residential developments), and readily available data on traffic patterns on associated arterials and highways. The modal split issue is usually fairly easy, as local planners in smaller cities and suburban areas can typically assume that virtually all personal trips are being made by private automobile, with the main exception being trips by school bus and a limited number of transit (bus) trips made for journey-to-work purposes. In the City of Binghamton, N.Y., for example (discussed earlier in Chapter II), the work trip modal split for the various origin-destination patterns shown in Table III.1 existed in 1970. The expected modal patterns are fairly evident here; i.e.,

- travelers to or from the more dense center city has the highest use of transit modes;
- travel within the surrounding, lower-density communities is much more auto-oriented; and
- the overall role of transit is small, even for the work trip (typically the trip purpose for which transit is most suited)

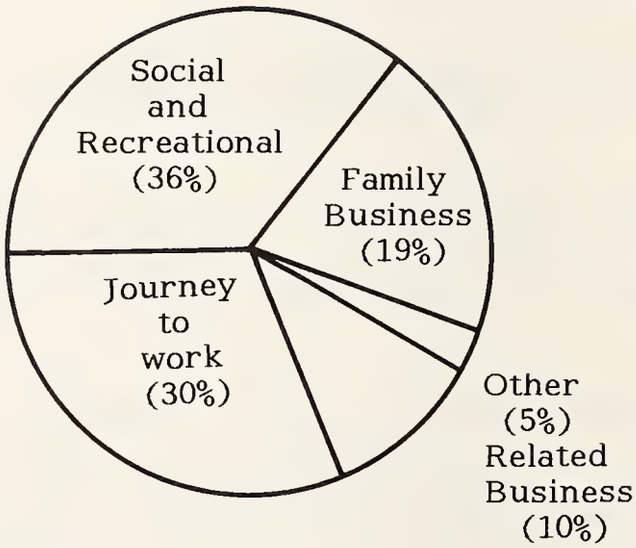

FIGURE III.1
DISTRIBUTION OF TRIPS BY PURPOSE IN SMALL CITIES (<50,000)
(SOURCE: SEE TABLE III.3)

Exactly how the community would respond to the advent of a significant shortfall of gasoline will also be a very difficult thing to project. Experiences from previous contingencies to provide some insights, but: (a) relatively few areas nationwide actually experienced significant supply problems during the 1973-74 and 1979 crises; and (b) measures of the impact of such shortages are typically very aggregate in nature, even for larger urban areas. The Greater Buffalo Area, for example, collected data on selected traffic count and estimated changes in transit usage during the 1973-74 oil embargo and the mid-1979 crisis as part of its energy contingency plan (16). While some origin destination data were available for more detailed assessment of baseline travel conditions, there was not that much hard information that could be used to set the course of strategies for future contingencies. The plan that was eventually set for Buffalo, like that for other relatively large cities, was dominated by the expanded and more energy-and cost-effective use of that area's bus system.

The next chapter reviews those strategies that appear to hold the most practical promise for small urban and large suburban areas. Strategies are assessed on a consistent basis to determine how they might be implemented, what impediments exist to their effectiveness, and what types of contingency-related mobility problems could they help to resolve. Finally, in Chapter V the overall array of feasible strategies is reviewed in terms of: (a) what contingency needs can be effectively met; (b) which ones will present the greatest challenges to transportation planners and citizens and firms of such areas; and, (c) what actions need to be taken to assume that the maximum amount of contingency preparedness can be achieved.

TABLE III.1

WORK TRIP MODAL SPLIT FOR BINGHAMTON, N.Y. AREA (1970)[1]

AREA OF RESIDENCE[2]	AREA OF WORK SITE	% AUTO	% TRANSIT
Binghamton City	Binghamton City	90.2%	7.3%
Remainder of Broome County	Binghamton City	95.1%	3.4%
Remainder of Broome County	Remainder of Broome County	96.1%	1.9%
Binghamton City	Remainder of Broome County	94.2%	5.1%

[1]Only conventional transit and auto driver and passenger shown.

[2]Broome County, as presented in the "Journey-to-Work" Statistics, consists of "Binghamton City" and "Remainder of Broome County," with the latter representing the suburban/rural areas around Binghamton.

Source: (11)

CHAPTER IV

CONTINGENCY STRATEGY OPTIONS FOR SMALL URBAN AREAS

1. Introduction: Goal of Strategies

The basic goals of any plan to either conserve transportation energy use as a general policy or efficiently reduce personal demand during a supply shortfall are essentially two-fold:

- reduce overall vehicular tripmaking -- the number of trips made by citizens needs to be reduced by eliminating or combining discretionary travel, trip-chaining, use of phones, etc.; and
- increase the use of high-occupancy vehicles -- get people to make trips in transit or paratransit modes, including converting their own vehicles to carpools for various tripmaking.

While a variety of reports (e.g., 4, 17, 18) discuss a wide range of potential strategies that could be implemented, it is clear that small urban areas tend to have very specific and relatively limited number of strategy options. The lack of any significant conventional transit or organized paratransit infrastructure makes it very difficult to depend on such modes (especially the former) for short-term contingency relief. The apparent benefits of creating or significantly expanding such operations so they can be in-place for contingencies must be analyzed very closely. They frequently will be found inefficient on both financial and energy grounds, particularly in the smaller lower density settings with which this report deals.

These smaller local governments will also have very little experience in any plan to reduce vehicular travel or constrain access (e.g., parking restrictions or surcharges, organized ridersharing programs, etc.). The local citizenry and business sectors will likewise be unfamiliar and often rather unreceptive or even hostile to various strategies that try to change their long-established, auto-dominated habits. The extent of this resistance will depend on the public's perception of the likelihood of energy contingencies as well as the actual severity of the shortfall and/or fuel cost increases when they occur. The principal factor, however, that can win the public over to more energy efficient travel is

that these steps can also mean more cost-effective travel at the same time. In an era of higher travel costs (and high inflation in other areas as well), such ideas as carpooling to work and using park-n'-ride lots for commuter rail or bus trips make economic sense. This single factor clearly helps foster such measures as on-going conservation strategies while making it easier to depend more heavily on them in special contingency circumstances.

2. Potential Contingency Strategies

In this section those strategies that appear to hold the most promise as feasible, implementable, and cost- and energy-effective energy contingency measures in small urban areas are reviewed. The analysis of each strategy will follow a consistent format that includes the following major elements:

- Targeted Mobility Needs - what particular travel demands will this strategy be most effective in meeting to help relieve contingency-related problems.
- Institutional Arrangements -- what public and/or private group(s) will be responsible for the planning, administration and implementation of this strategy.
- Timeframe -- how long will it take to implement such a strategy, and how quickly can the targeted travel groups be expected to comprehend and respond to the plan.
- Finacial Arrangements -- how will the costs of the program be handled, and how much should these costs be (in an order of magnitude sense).
- Special Strategy-Specific Problems -- what other constraints or barriers might hinder the success of this strategy.

After all of the strategies have been reviewed, an overview evaluation of the cumulative effect of these strategies will be presented in Chapter V, including recommendations for appropriate actions by these local government bodies. It should be pointed out that a brief energy contingency fact sheet/guidebook has also been prepared as part of this research effort that will give more explicit guidance to local officials on where and how to obtain useful information, contacts for further assistance, and related materials. This is presented in Appendix B.

3. Range of Strategies Available

The U.S. Department of Transportation, in March 1979, informed the regional UMTA and FHWA offices that all Metropolitan Planning Organizations (MPO's) be told that they "...strongly recommend inclusion of contingency plan development in each (MPO's) Unified Planning Work Program" (19). The memorandum included a discussion of the key issues and actions that deserved consideration in the development of such plans. These items fall into three major areas:

1. Transit and Transit Operator Oriented Issues/Actions -- e.g., maximize use of existing fleet, expand standby fleet, find methods of expanded service, adding personnel, using transit for more non-work trip travel, etc.

2. Metropolitan Area Wide Issues/Actions -- e.g., variable work hours, HOVL's and other TSM actions, expanded use of taxis, ridesharing, park-n'-ride, etc.

3. State-Wide Oriented Issues/Actions -- e.g., measures to reduce travel, allowance of higher truck weights, overall coordination of plans at local level (especially where state actions were needed), etc.

Unfortunately much of the thrust of these three areas (especially the first two) has relatively little applicability in smaller urban areas. Existing transit service and usage is virtually non-existent in these settings, and many of the related actions (e.g., HOVL's, park-n'-ride lots) are also of limited usefulness in sites with relatively low residential and commercial densities and the accompanying "many-to-many" travel patterns.

There are, however, a number of contingency plan options that could be viably applied in small urbanized areas. Some of them can be carried out with little or no governmental planning or financing, while others would require significant investments of time and funds. Some would probably receive considerable public support and/or compliance, while others might be viewed with anything from mild skepticism to stiff resistance. These strategies are not presented here in a way that qualifies one as superior to another, as such factors will depend on the nature of the city involved. The plans fall into one of the following general areas:

- Reduction in Vehicular Travel -- aimed strictly at using less VMT to provide the same PMT; i.e., it attempts to accommodate the mobility needs as they exist.

- Reduction in Travel Demand -- attempts to lower individuals' demand for various forms of travel, hopefully while allowing them to fulfill approximately the same social and economic needs (work, shopping, recreation, etc.).

- Improvement in Travel Conditions -- aims at altering the operation of a transportation facility to make it more energy efficient through changes in travel conditions (e.g., traffic flow, maximum speed, etc.).

- Improve Energy Supplies -- attempts to increase the actual or effective supply of motor fuels available for either general consumption or for a specific subset of vehicles (e.g., taxis, vanpools, school buses, etc.).

The following strategies are classified under one of these four areas, and are then discussed in more detail:

- Reduce Vehicular Travel
  - Expand Available Conventional Transit
  - Establish Auxiliary Conventional Transit
  - Expand/Establish Paratransit Options
- Reduce Travel Demand
  - Call for four-day work week
  - Encourage linkage of trips
  - Substitution of telecommunications for travel
  - Cancel Travel-Intensive Meetings, Public Affairs, etc.
- Improvement in Travel Conditions
  - Restrict on-street parking on important travel routes
  - Special traffic management measures
- Improve Energy Supplies
  - Secure fuels for transit operations
  - Secure fuels for paratransit vehicles

4. Assessment of Energy Contingency Strategies to Reduce Vehicular Travel

a. Expand Available Conventional Transit Operations

• Background. A review of urban areas in the roughly 50,000 population range shows that very few of them have any regularly scheduled transit operations serving local (vs. intercity) travel needs. Frequently the operation providing what limited conventional or subscription/charter services exist is also the local school bus operator. Any transport firms that already exist with even limited on-going experience with fixed-route operations can potentially make the provision of additional services occur more smoothly and in a shorter timeframe. In addition there is the problem of trying to service a public that is unaccustomed to using such services, with most citizens totally unaware of which types of trips could be effectively handled by these modes. The lack of experience on both the supply and demand sides of the transit market are probably the single most difficult hurdle to overcome here.

• Targeted Mobility Needs. Conventional transit operations especially in smaller urban areas, are almost exclusively used as journey-to-work modes. Only trips of this nature typically provide the range of temporal and spatial density of trip origins/destinations upon which such modes depend. Available data from Buffalo, New York (20), for example, show this factor very clearly, as outlined in Table IV.1. While that region's fairly extensive bus system (much larger than found in any small urban area) handles less than 4 percent

TABLE IV.1

TRANSIT USE BY WORK AND NON-WORK TRIPS AND AREA IN GREATER BUFFAL, NEW YORK AREA

	TRANSIT MODAL SHARE FOR		
	WORK TRIPS	NON-WORK TRIPS	TOTAL
Buffalo CBD	29.8%	13.0%	23.0%
Rest of Buffalo	11.0%	6.8%	8.0%
Rest of Region	1.6%	0.6%	0.9%
Total Region	6.6%	2.6%	3.6%

Source: (5)

of the total person trips in the region, it carries almost 30 percent of those traveling to work sites within the CBD. In addition, in the "Rest of Region" zones (where over two-thirds of the total region's person trips occur), transit could only serve 0.6 percent of non-worktrips but 1.6 percent of the worktrips; i.e., as the density of an area decreases, the role of the worktrip in conventional bus transit use tends to increase. Any diversions to transit during fuel shortages can also be expected to be mainly worktrips, with other alternative modes or travel decisions (e.g., carpooling, trip chaining, etc.) left to handle non-work travel, especially in lower density areas.

- Institutional Arrangements. Existing transit services generally fall into one of the following three institutional categories:

  - Publicly Owned/Operated
  - Privately Owned/Publicly Subsidized & Regulated
  - Privately Owned/Publicly Regulated

The greater the existing government ownership, control, or financial involvement, the more easily any real (vs. "on-the-shelf") contingency planning can be carried out. Strictly private operations, for example, may clearly be unwilling to absorb the costs associated with expanding fuel storage facilities, stockpiling of old buses as they are replaced, and related contingency measures. The level of government involvement in local transit operations will therefore have to increase in an energy contingency context. It is very likely, however, that local (i.e., municipal/town) agencies and officials will play a lesser role than those on the county level, as such services tend to encompass numerous local government jurisdictions. Without an MPO-type planning structure (which most small urban areas lack), the equivalent of one may have to be created if the county government cannot provide this coordinating function. Local government agencies and elected officials under any arrangement will still have to consider how to institutionally handle: (a) the financing of its share of planning costs and stand-by guaranteed funding for contingency service expansion; (b) the determination of how, when and where existing services should be expanded in energy shortages (routes, frequency, fares, etc.); and, (c) the selection of what local agency or consortium of agencies will be responsible

for the overall coordination of contingency actions by transit operators as well as other contingency-related actors (e.g., state agencies, paratransit operators, major employers, etc.).

- Timeframe. Any actions associated with local transit services will require a considerable amount of lead time for planning, financing, logistics, etc. Whether the existing operation is totally public, private, or some variation in between, those ultimately responsible for the provisions of transit services will face the following major challenges:

  - Fuel Supplies - how to provide for expanded demand, attainment of necessary fuel allocations, storage needs, etc.;

  - Maximize Contingency Fleet Efficiency and Effecitveness -- operations should be cost- and energy-efficient (high load factors, minimize stops) while meeting the crucial contingency travel needs as effectively as possible; and,

  - Expanded Capacity -- need to find ways to temporarily increase the available vehicle fleet at short notice, find qualified stand-by drivers, handle extra maintenance needs, etc.

The transit operator or some other entity will need to handle the "marketing" of the existing and special contingency-only services to get citizens to realize what is available. The establishment of a real transit contingency plan that could go into effect within a week of the shortage's confirmation will probably require 6-12 months. However, this could be substantially shortened or lengthened depending on: (a) how complete the existing transit planning/operating entities are, and, (b) how great the local public's resolve to establish such transit-based protection against energy shortfalls.

- Financing and Implementation. As of 1979 roughly half of the nations transit systems were publicly owned, but these systems included 87 percent of the transit vehicles and provided over 90 percent of the transit VMT and person trips (21). The average public operation has over ten times as many vehicles, route miles and annual passengers as its private counterparts. The majority of the roughly 230 transit systems that exist in cities that are less than 50,000 and outside the influence of a larger urbanized area are private and therefore receive little or no capital or operating assistance from Federal,

State or local sources. They generally function independently, although there are situations where they act jointly for economic, legal or political reasons (e.g., in New Jersey there are 12 "bus-owners' associations" regulated by the State's Board of Public Utility Commissioners). Methods and procedures will have to be established that can both determine the size of subsidy needed (if any) to guarantee that various contingency services will actually occur in "quick-response" fashion. Operators will of course have the

FIGURE IV.1
THE ROLE OF CONVENTIONAL TRANSIT EXPANDS DRAMATICALLY IN ENERGY CONTINGENCIES

benefit of additional passenger revenues to help defray part or all of the costs of expanded service. However, responsible government agencies need to address: (a) the types of fares that are to be charged, (average level, and differentials by time of day, direction, service quality, etc.); and, (b) whether local government or private sector support for lower fares and/or higher service is both justified and realizable. Large employers, shopping malls, and similar major trip generators could provide financial assistance for special transit operations that help support their operations. Their assistance in informing the public as to what services are available (e.g., as part of television, radio, or print media advertisements) could be a particularly useful and cost-effective input due to their experience with marketing.

The actual implementation of the expanded transit operation would depend on some pre-established trigger mechanism based on a measure of the severity of the shortfall. Obviously the initiation of the Federally-controlled rationing system (20 percent shortfall for 30 days) would signal a severe enough problem to justify all possible efforts. For lesser problems, the transit operator could use its own discretion in making limited increases in service for relatively small fuel problems of short duration. However, to justify the calling out of a larger vehicle fleet, hiring additional drivers and related personnel--i.e., making the change-over to the contingency service plan some severity criteria will have to be met. It would be impossible and incorrect to try to offer here some objective, transferable index (e.g., x percent shortfall for y weeks) to be used for this purpose. The important point is that some mechanism be established that would be controlled by the designated "lead agency."

A fair amount of on-going assistance is also required of both the operator and the relevant agencies to guarantee that: (a) the selected contingency services are well suited to the travel demands; (b) fuel supplies are adequate; (c) necessary financial support is forthcoming; and, (d) related issues and problems are being addressed, including coordination of transit with other alternative services. The lead agency must also re-check the implementation arrangements on a regular basis before a contingency occurs to assure that all actors know and are prepared to cover their responsibilities to the program.

- Special Problems. The ability to get more effective capacity out of existing transit operations are limited from the start by the relatively unimport-

ant role that these modes play in personal travel in small urban areas. Very few travelers ever use the modes. Even if they desire to find such an alternative during a fuel shortage, they lack the knowledge of the system and often do not know how to get the necessary information (reading schedules, park-n'-ride arrangements, zonal fares, etc.). A well designed, straightforward system is needed with good marketing approaches, easily understood maps and schedules, clearly delineated stops, and the cooperative support of relevant government agencies, the media, and the commercial sector (e.g., "how to get here by bus"). Similarly crucial issues include the expanded fuel allocations for these transit lines, the possible need for public subsidy funds, and the whole problem of attempting to cost-effectively maintain stand-by vehicles, drivers, maintenance staff and facilities, etc. It is important here that the most appropriate travel markets be selected for these relatively modest transit operations, with the full realization that a poorly designed transit system can easily be less energy efficient than even the single-passenger automobile. The coordination of transit and other alternative modes, is also essential, assuring that each mode is efficiently and effectively run* while successfully interfacing with other modes. This point is discussed further in this chapter.

b. Establish Auxillary Transit Service

Background. Clearly much of the discussion under the previous strategy would apply here, although the challenges faced by local governments are now even greater. The institutional structure implicit in even a modest existing transit operation would now be lacking, leaving all aspects of such services (vehicles, drivers, management, route planning and scheduling, etc.) to be created. The vehicle availability problem may be the most absolute constraint, as the competition for otherwise unutilized vehicles will obviously be keen during shortages. One source of vehicles that almost every area has in school bus fleet, although a variety of problems and constraints exist that require serious steps before the use of such vehicles can be realized. It may, how-

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*The term efficiency typically means "doing the thing right"--i.e., operate a transit service at the lowest cost, least energy use, etc.; effectiveness usually refers to "doing the right thing"--selecting the services to most closely match the demand patterns in the community. Clearly the two terms are interrelated. For a discussion of this, see Reference 22.

ever, be the only realistic source of quick-response, stand-by vehicles for those areas without a regular local transit operation. These and other issues are addressed briefly in the sections that follow.

Targeted Mobility Needs. The specific travel groups identified under the "expand existing services" strategy would also apply here, except the concentration on work trips would probably be even greater. Special arrangements with major employers, large residential and commercial concentrations, and other groups might also be necessary to assure that a clearly defined market exists for these services. Whether a more formalized and extensive travel demand forecasting effort is justified will depend on the planned complexity of the system and the resources and skills readily available to perform analyses of that type. However, no matter what level of sophistication is eventually applied, the following basic issues will have to be addressed before embarking on any local transit development plan:

- Service objectives -- what will generally be expected of these services in terms of groups served, areas covered, etc.
- What service opportunities exist -- what transit (or paratransit) services could feasibly be developed, and could they achieve the stated objectives.
- What could transit services do -- through assessments of potential demand, available financing, regulatory constraints, etc., what type of transit market could cost-effectively be served.
- Would alternative modes be better -- could other modal options (various paratransit systems) serve the same (i.e., equivalent or larger) travel markets more cost-effectively than conventional transit.

To establish program objectives, review possible services, and carry out the other pre-implementation measures outlined here may frequently be asking more than local agencies can effectively handle. While there are documents available (e.g., 23) that attempt to provide methodologies that can be followed for these planning steps, it will still prove difficult for many groups. However, some form of analysis in each of these areas is essential, and the results will determine which travelers will be helped (or harmed) by the eventual decision.

Institutional Factors. For areas starting a transit system from the ground up, a wide variety of institutional and/or regulatory problems and constraints will exist, many of which could easily frustrate those considering a system. There are, for example, numerous governmental controls on the operations of public transit systems. Initially created to protect passengers and the general public, these regulations present a number of often difficult hurdles that must be overcome before any new transit (or paratransit) operations are implemented. The major considerations here include:

- Federal (Interstate Commerce Commission) regulations on interstate operations;
- various state-level controls on the franchising of bus operations, typically as a regulatory function of the states' public service commission;
- state and occasionally local limitations on governments' ownership and operation of these types of operations;
- a variety of local regulations that can (at least initially) limit the range of options in certain areas (e.g., antijitney laws, taxi ordinances, etc.); and,
- a number of financial-related factors, including limits on taxation or bonding authority, insurance and licensing requirements for multi-passenger vehicles, etc.

These types of institutional problems will clearly increase the administrative time, costs, and delays necessary to create a new public transit operation. In addition, the entrance of Federal funds to support the capital or operating costs of a new system further increases such problems and adds some new ones, especially in the labor, equipment purchase, and financial reporting areas. In fact, some local governments may decide that it simply is not worth the additional administrative problems and operational constraints, the most controversial of which has been the requirements for special elderly and handicapped services under UMTA's Section 15. These factors would clearly have to be weighted against the fiscal advantages of often substantial capital and operating assistance. In addition, the area's dominant reasons for wanting to establish a new transit operation (e.g., a energy conservation economic development, backup service for temporary energy contingencies, etc.) will be a key

factor in determining whether involvement with Federal and/or transit agencies will be viewed as beneficial. Recent proposals to substantially reduce Federal operating assistance would; if realized clearly alter this situation considerably, putting even more pressure on the cost-effectiveness of such services.

FIGURE IV.2
SCHOOL BUS FLEETS ARE A POTENTIAL SOURCE OF
AUXILIARY TRANSIT VEHICLES

Those institutional factors dealing with such issues as special insurance coverage and labor union problems are often very delicate ones (especially the later), but can be effectively minimized by prospective operators if handled and resolved well in advance. A review of the problems associated with the use of school buses for fixed-route transit operations, or the establishment of large vanpool operations at major employers shows that such problems as increased liability coverage, training of drivers, fare collection methods and cash flow controls have frequently been stumbling blocks to the new operator. To high-

light these and other issues, a review of some of the special problems associated with the use of school buses in a contingency transit fleet is presented in Appendix C.

- Timeframe. There is clearly no set period of time necessary for the establishment of a new bus transit service. The actual time needed will depend on the following types of factors:

    - the size and complexity of the services that are invisioned, including the number of vehicles, types and number of routes, hours of operation, areas served, etc.;

    - the availability of any type of planning or operational infrastructure in the area that can provide the expertise necessary to establish and manage a system: i.e., the further up the "learning curve" the local agencies already are, the faster the service implementation should proceed; and,

    - the availability of a suitable vehicle fleet that can be converted and/or used temporarily as contingency transit vehicles (e.g., school buses). Without such vehicles, the local governments will be forced to purchase new or used vehicles, which can entail lengthy administrative and production related delays. (The high demand for buses during an actual contingency will make it very difficult to rent buses at these times).

When all of the associated financial, administrative and institutional factors are considered, it would appear that 12 to 15 months of concerted efforts would be required by local agencies in association with regional and state authorities, large employers and other major trip centers. After the system had been established and made truly standby (drivers selected, trained and licensed, vehicles inspected, insured and secured for use, insurance issues resolved, etc.), it should probably take no more than one week after the prescribed shortfall conditions (X percent shortfall for Y days) have been identified for the system to be at least partially operational. This assumes that the system would have received andhave in storage at least part of its fuel allocation (under Special Rule #9), and have made every effort to assure that its "base

period" allocation is sufficient for its projected needs. It should be noted that the Manditory Petroleum Allocation Regulations are scheduled to be phased out on September 30, 1981 unless Congress should act to renew them. If they are allowed to drop, fuel purchases would be a simple matter of supply and demand.

- Financing and Implementation. The financial arrangements necessary to establish a viable standby transit operation will clearly be as varied as the systems involved. The purchase of vehicles vs. the use of an existing private or public fleet will be a major cost factor, and the types of fares charged for the services will dictate the size of the operating "profit" or deficit. Some balance must be found between minimizing the use of scarce government resources and the expenditure of sufficient funds to attract prospective transit consumers with viable service without unnecessarily high or inequitable fares. If fares are set too high, potential riders may opt to either use their cars or not travel, leading to either higher overall energy use or decreased mobility. Higher fares, but with lower patronage, could easily lead to lower passenger revenues and higher deficits.

The availability of bonding authority may be necessary if substantial public capital costs are going to be involved. The financial limitations within which the responsible local agency must operate will clearly have a strong effect on not only the size of the potential system but the types of services that are to be provided. The use of existing school buses for off-peak operations, for example, would be a relatively low capital cost option. However, load factors and therefore passenger revenues per vehicle mile would tend to be lower for this type of service than for, say, peak period express bus operations between relatively high density residential areas and employment centers. The overall financial plan for an auxiliary transit system must therefore be tied closely to the basic social, economic and energy goals the system and the associated service, pricing and patronage levels needed to achieve them. Such a plan must be established early in the planning stage and realistically evaluated before any serious moves are taken to implement the system.

- Special Problems. The main reason that the development and implementation of an auxiliary transit operation in an energy shortfall will create special problems for local agencies, citizens and private firms in small urban areas is that these individuals and groups are very unfamiliar with both the

operation and use of such systems. The entire process will certainly be a tremendous learning experience for those involved in the process. It must be stressed here, however, that the use of an auxiliary conventional transit system may not be a cost- and/or energy-efficient strategy for a particular city. Financial, institutional, regulations, and various political considerations may simply be viewed as too difficult to overcome. This is particularly true when one remembers that very few areas actually expienced any real fuel supply problems during past energy crises. This will make it difficult for local citizens to realize that substantial upfront contingency preparation expenditures are essential. The fact that transit systems in larger, more transit-oriented and higher density urban areas face serious financial problems does not argue well for such systems in smaller urban centers.

c. Expand/Establish Paratransit Operations

· Background. The word "paratransit" has come into vogue in the last 5-6 years as a wider number of citizens, agencies, and private firms have come to realize the considerable benefits that such modes can provide. Paratransit here is defined as all private or public arrangements such as carpools, vanpools, subscription bus operations, dial-a-ride, etc. that generally use moderate-sized vehicles to meet specific mobility needs in medium-density travel markets. The major options generally include the following:

- Personal carpooling -- individual citizens independently joining together to rideshare for work trips and (to a lesser extent) other types of trips.

- Employer-based ridesharing -- individual employers or groups of employers (e.g., office complex, industrial park) making a concerted effort to get their employees to travel to work in carpools, vanpools, or other paratransit (or transit) options.

- Government-based ridesharing -- special government entities are established to both work with employers to get programs started as well as performing a separate ridesharing effort for the general public to get citizens' rides matched up into high-occupancy vehicles.

Each of these has a definite role to play in any contingency planning scheme, and they are all clearly interrelated as well. Some urban areas already

have a substantial amount of such activities in operation. The past energy crises, the need to reduce vehicular emissions, or citizens' or employers' desire to reduce transportation costs, have all provided the necessary incentive to boost ridesharing. In most of its forms, paratransit is inexpensive for the traveler relative to other modes, more than pays for itself in saved travel costs, and has a broad public acceptance. All these factors tend to make the local government's role a fairly easy and small one, as the following sections outline.

· Targeted Mobility Needs. The general focus of most paratransit operations is the journey-to-work trip. The main reasons for this are that:

a. such trips are generally predictable in terms of frequency, time of day, etc.;

b. at least one end of the trip will include a large number of shared trip ends, as people will be working at the same location; and,

c. the large number of trips made annually means that travel cost savings can be substantial for the regular user, thereby making it worthwhile to figure out a way of using such modes.

The larger the density of trips at any point (e.g., major employers, large apartment complexes), the easier it will be to match up riders for any type of trip. Non-work trips are more discretionary in nature and therefore easier to reduce or at least temporarily eliminate. However, they are not as easily organized into group riding arrangements, as the number of destinations is usually large and are less likely to overlap among individuals. In addition, a work-trip focused ridesharing program can actually increase non-work trip travel (unless energy supplies are seriously short), as the availability of a vehicle at home will be increased (24).

· Institutional Arrangements. As the previous discussions have demonstrated, there are a wide array of institutional arrangements that can prove successful for paratransit services. After one moves above the level of individual citizens making their own ridesharing arrangements, the main issue is whether some form of "third-party" systems is needed to significantly expand ridesharing in general or make available a variety of paratransit options in energy contingencies. The third-party approach in which an existing or spe-

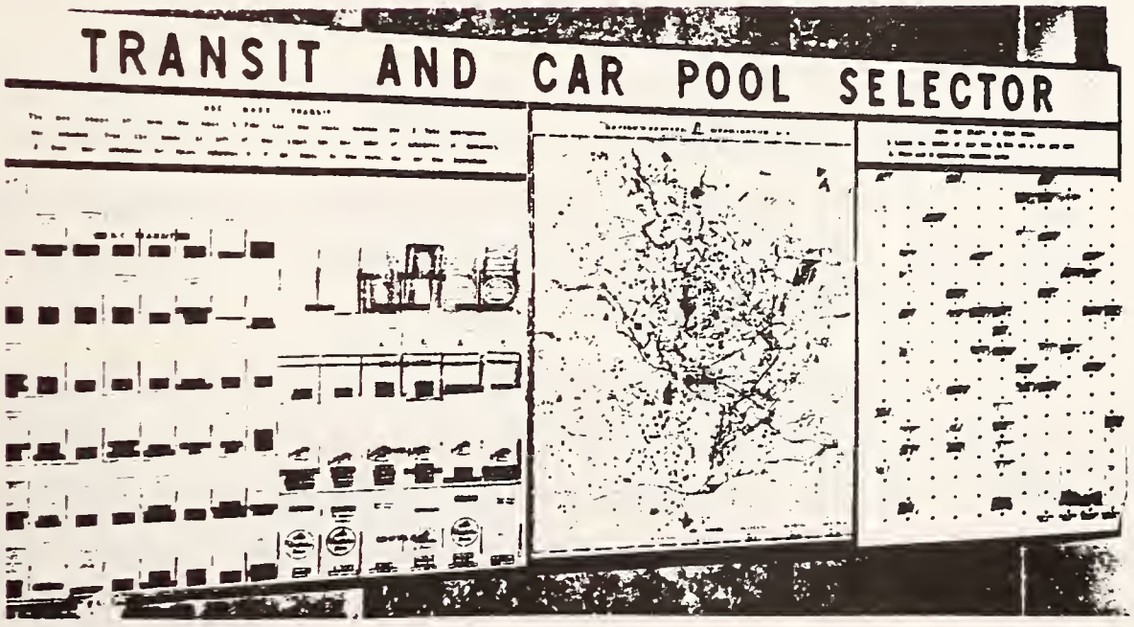

FIGURE IV.3
CARPOOLS AND VANPOOLS ARE THE MOST COMMON
PARATRANSIT OPTIONS

cially created public or semi-public organization oversees the ridesharing activities of numerous firms is relatively rare. Employer-based programs are generally the most common, traditional arrangements, and also the most successful. Vanpool, vs. carpool operations are somewhat likely to use the third-party approach, mainly due to the substantial costs involved in vehicle purchase, insurance, and related areas.

There are a multitude of institutional problems that have gradually been addressed over the past few years as paratransit programs have expanded. The liability insurance problem was one of the first major issues to be dealt with, and has since been somewhat resolved as insurance firms and paratransit agencies and groups have become familiar with the issues involved in the standard journey-to-work oriented vanpool program. An individual driver's coverage for carpool participants obviously should be addressed, as one's liability clearly increases if one frequently has 3 or more "bread winner" passengers in his/her car. Additoinal problems include such factors as:

- local or state regulations on transit operations, jitney services, etc. which may block the implementation of various services (mainly vanpools);
- any special vehicle registration, inspections or related regulations that may apply; and,
- the "in-kind" income that drivers (especially of vanpools) receive under most arrangements, and the treatment of this as income by the Internal Revenue Service.

By far the most successful paratransit arrangements have been those that have been employer-based (25). Area-wide programs to match members of the general public in carpools or vanpools have generally be ineffective and relatively expensive. In contrast, employers have certain definite advantages; i.e., (a) they can use the existing computerized payroll system to match workers; (b) by definition the workers have a common destination which facilitates matching; and, (c) the employer can more easily provide additional incentives for carpoolers (preferential parking, other special bonuses, etc.). Employees also feel to some extent that they are part of the same "family", even if it is a very large firm, which reduces suspicion and therefore increase the likelihood that people will share travel information and ride with others.

The role of government agencies in the typical small urban area could in most instances be limited to informing employers of the benefits of ridesharing even without an energy shortage (lower employee travel costs, lower parking space requirements, etc.). Simply providing "how to" materials or the contacts necessary to get them, and removing where possible any impediments to ridesharing developments are two key actions that local governments can follow. There could also be some assistance in helping firms or special interest travel groups to work cooperatively to maximize the use of these modes. This would principally apply to vanpool operations, where, for example work-trip vans could be used in the non-commuting hours for elderly citizen transport, to provide feeder service to conventional transit modes, and similar uses. However, the more "joint uses" of vehicles are attempted, the greater the administrative, financial, and legal/regulatory problems local governments will encounter. Some observers have also seriously questioned the benefits, including energy savings, of such extensive involvement and investment in paratransit and integrated transit/paratransit efforts (26). It also increases the potential for conflicts with existing operations--principally taxi services--that presently provide some of these services. Every attempt clearly needs to be made to coordinate any government paratransit actions to avoid duplicating any of the mobility provided by such operations, as well as not stepping in where private business associations (e.g., Chambers of Commerce, local industry council, etc.) could handle such matters with equal or greater ease.

- Timeframe. The nature of these operations vs. those of conventional transit is such that the total time from initial planning to actual implemion readiness can be relatively short. Vanpool operations tend to take longer due to the necessary purchase of vehicles and more detailed regulatory problems. However, vanpool programs are by their very nature going to function more as conservation than contingency operations. The vans cannot be purchased on very short notice, and when purchased can surely not be allowed to go unused except for energy shortfalls. Carpooling, as it entails the use of the existing private car fleet, does not present such problems. When in place (e.g., each employee has a match that is updated frequently, drivers are already established and familiar with the vehicles, etc.), it should only take a few days to get the program fully operational. The severity of the shortfall and any asso-

ciated increases in fuel costs or gas station lines will be a major factor in determining how quickly and thoroughly these matches are made. More involved paratransit integration efforts would obviously take more time to develop, but should also be fairly quick to implement after shortfall conditions have been reached.

· Financing and Implementation. At one end of the financial scale, large third-party vanpool programs with 30-50 vans and numerous employers have had multi-year funding of up to $1 million (27). These programs, however, are very active, far reaching efforts that in no way represent the only way to go for vanpooling and would not apply to carpooling. Ridesharing programs are generally among the least expensive and most cost-effective of all transportation programs, mainly due to the use of existing vehicles and the large array of in-kind assistance that private firms and other groups are understandably willing to supply. Most of the governmental expenditures will fall into such areas as the preparation of self-help brochures, the establishment of ways to "get the word to the people" concerning ridesharing and transit where available, and removal of any barriers to successful private or public paratransit responses to energy shortfalls. In fact, some observers feel that government paratransit expenditures should be limited to these areas (5).

· Special Problems. Unlike the creation and/or expansion of conventional transit systems, paratransit modes pose considerably fewer basic problems. Mainly due to the fact that such modes are much better suited to the travel and land use patterns of small urban and large suburban areas. The conflict that has been found to occur between paratransit and transit operations (i.e., the former drawing patrons off of the latter) does not apply as much due to the very limited presence of transit in these areas. Governmental costs are generally low, public receptivity is usually high, and (most importantly) most of these contingency responses will occur without any government intervention.

5. Strategies to Reduce Travel Demand

· Background. A number of possible actions were mentioned earlier in this Chapter that were aimed at an actual reduction in travel demand (vs. handling existing demand in fewer vehicles via greater use of ridesharing, transit, etc.). These included a reduced work week, substitution of telecom-

munications for travel, and various other measures. Many of these are actually not fully within the legal authority of local governments, with agencies' main role under this strategies one of advocating various actions by both the private sector and individual citizens. These potential strategies are presented jointly in this section, as many of their characteristics are similar and the actual role of local government is fairly small.

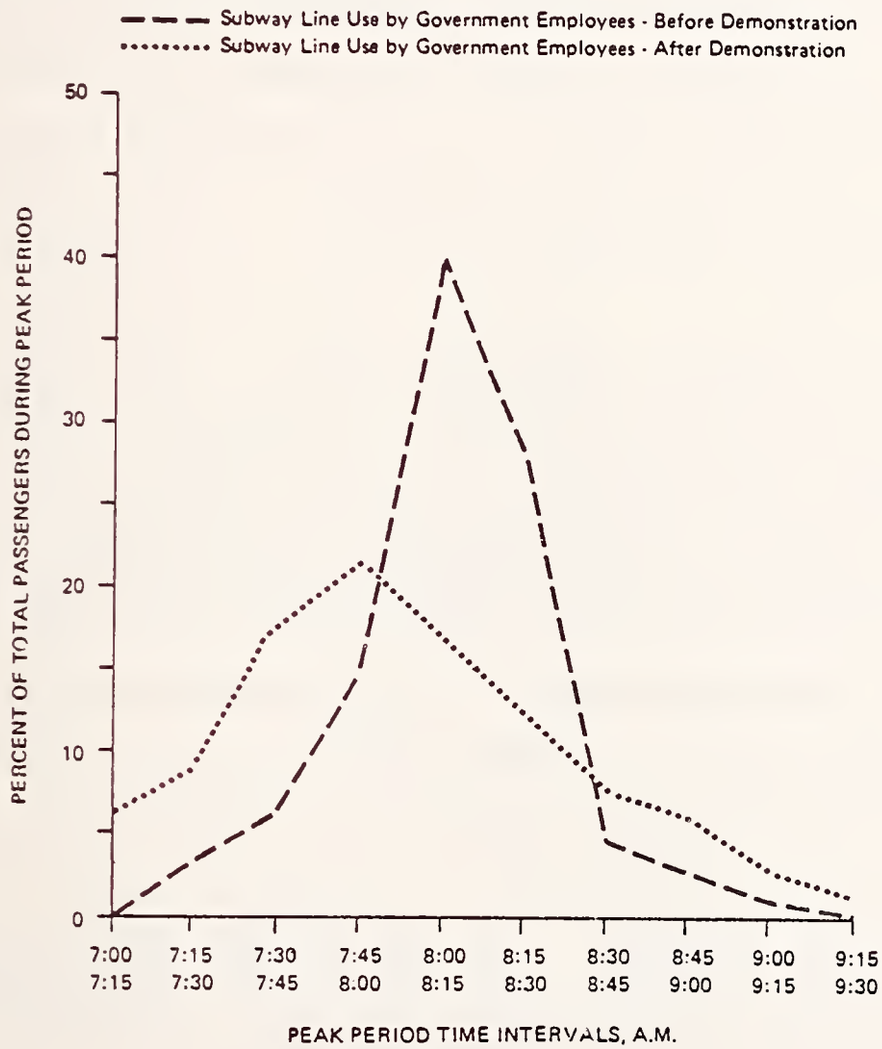

FIGURE IV.4
REDUCED WORK WEEK AND FLEXTIME OPTIONS CAN SUBSTANTIALLY REDUCE VEHICULAR TRAVEL
(SOURCE: REF. 28)

· Targeted Mobility Needs. Most of the trips that can actually be reduced--i.e., that are more discretionary in nature--are non-work trips, especially those that are not necessary to social and economic life in the short-run (e.g., vacations, visits to friends and relatives). So-called "social and recretional" trips presently account for over one-third of personal travel in

small urban areas (see Table II.3), so fairly significant travel (and energy) savings can be achieved in this area. This type of action is clearly up to the individual discretion of private citizens, and cannot be forced on the public. Citizens' reactions during past crises have shown however, that they are very willing to cut back in this area through cancellation of trips, linking social/recreational trips to shopping or even worktrips, and similar measures (4).

Worktrip travel demand can also be decreased by those measures that, quite simply, reduce the number of days that individuals travel to work. The basic concept of 4 days × 10 hour workweek vs. 5 days × 8 hours has been offered under a number of different programs. Some of these directly control when employees come in (e.g., Mondays off for fixed percentage of workers at various levels, different day every week, etc.). Others ("flextime", "maxi-flex") leave it more up to the individual worker to make his/her own arrangements within prescribed limitations (28). By definition if each worker could travel 4 days instead of 5, the savings in VMT and energy could be as high as 8 percent of the total in a region, assuming that roughly 40 percent of vehicular travel in small cities is for work-related purposes (see Table II.3).

The role of telecommunications in energy contingency (vs. conservation) planning is relatively small on a formal, institutional basis, although it can have a substantial effect when simply carried out by individuals (e.g., call relatives rather than visit them). While some work trips might be reduced, the bulk of the trip reductions due to this factor will probably be among the more discretionary non-work trip purposes. It is also not the type of action that can be regulated or mandated easily by a local government, but rather something that private firms and citizens have to arrange themselves.

The opportunities for local governments to cancel meetings, hearings, etc. during contingencies will probably be fairly limited in both their number and the actual amount of energy saved. In addition, many of these, while not matters of life and death, do represent the continuation of the functions of governance and possibly on principle should not be cancelled.

- Institutional Arrangements. There are relatively few legal or regulatory problems associated with voluntary travel demand reduction scheemes. The main role of local government is merely to inform the public as to the ways

that it can comfortably reduce its travel needs. A decision could be made to formally require all employers over a certain size to submit Four Day Work plans for review and/or approval. These plans would then be implemented when the pre-established shortfall conditions are reached. However, to actually require that firms and public agencies submit a certain type of plan would probably face heavy legal and political resistance. A voluntary program, with the local government mainly providing technical assistance, would probably face fewer problems when being planned and actually implemented. There is also the very serious issue of union regulations and those portions of contracts dealing with basic working conditions, including maximum hours of work per day before overtime rates are required. There is clearly a definite institutional role for the relevant unions in such cases.

- Timeframe. The range of strategies discussed here (4 day work week, trip chaining, etc.) could be very quickly implemented when the contingency arrives. Most of them require that local government agencies (and most importantly one energy contingency lead agency) merely provide useful "how to" technical information (e.g., how to convert to a four-day work week), making sure that government agencies and their employees are doing as much as they can, and providing an organized media program that will sell these and other programs to the public (e.g., bank by phone, trip chaining of shopping and work trips, etc.). Roughly six months should be sufficient lead time for such actions, although more formal schemes will entail a longer planning stage.

- Financing and Implementation. As was the case for ridesharing programs, the financial burdens that such demand reduction schemes would place on local governments would be relatively minor. The preparation for and actual carrying out of the information provision efforts, including fliers, technical support documents, and media plans will probably represent the largest government expenses in these areas.

- Special Problems. Depending on the nature of the local economy, and its sensitivity to a shorter average work week, this type of program might not be received very well. The special problem of the working parents, with 10 hour days causing a strain on childcare arrangements, would also have to be handled delicately.

6. Strategies to Improve Vehicular Travel Conditions

- Background. The basic concept at work in strategies of this type is essentially two-fold:

  - improve general vehicular travel conditions in a way that will reduce energy consumption per VMT; and,
  - look for opportunities to provide preferential treatment for high-occupancy vehicles to make such modes more attractive.

Many of these actions are very similar to the "Transportation Systems Management" (TSM) actions that all MPO's are required to include as part of their comprehensive transportation planning process. Some of these are fairly easy to implement and face little public resistance (e.g., use of vacant lots for park-n'-ride activities). Others are more difficult and/or expensive and can face intense public antagonism (e.g., charging for formerly free parking, removing on-street parking on congested streets, prohibiting single-passenger vehicles from case areas, etc.). One reviewer referred to the former as "easy" TSM actions and the latter as "hard" with fairly severe energy conditions necessary for the public to accept the latter (15).

The general improvement in traffic flow, principally on major arterials, is typically done by some form of improved signalization. However, a computerized traffic signalization network would clearly be more of an energy conservation and air quality-related action, and not something that would be implemented only during contingencies. (It could, however, be adjusted during a shortfall to reduce stops, favor thru-traffic, provide signal override for transit vehicles, etc.).

- Targeted Mobility Needs. Due to the basic nature of generalized traffic improvement actions, they are not necessarily directed at particular types of trips. However, those are found on arterials serving the central business districts, with actions limited mainly to rush hours, will clearly be geared toward the work trip traveler. Most TSM actions by definition are work trip oriented, mainly since the congested rush hours offer the greatest opportunity to improve system performance (at other times the transportation network operates well under capacity). Similarly, those that are aimed at improving

FIGURE IV.5
CONTRA-FLOW BUS LANES ARE A COMMON MEANS OF
IMPROVING FLOW FOR PREFERRED VEHICLES

transit performances will also be worktrip oriented, as this trip purpose is the dominant one on such services.

· Institutional Arrangements. Most of these types of actions can be effectively handled by the local agencies responsible for traffic control and management. However, such agencies in small urban areas frequently have very little experience in the more sophisticated TSM actions, are limited by relatively old fashion, inflexible traffic-control equipment, and lack the time and money to do much about these shortcomings. State-controlled funds may be available to financially help to some extent, and many of the more effective improvements may actually be very low-cost and non-technical in nature.

The removal of on-street parking or the charging for perviously free or lower-cost off-street spaces may be difficult to legally implement and even more difficult to sell politically. This is especially true in the typical small urban areas where available free or low-cost parking is almost universally available. Property rights considerations could also enter into any situation where government agencies attempt to apply special taxes on privately owned or operated parking spaces. In general, the problems will be considerably less for "carrot" type strategies that provide inducements for positive actions (e.g., park-n'-ride lots for use as carpool staging areas) vs. "stick" type actions penalize travelers (e.g., congestion pricing, special parking surcharges).

- Timeframe. Many of these types of actions could be implemented almost immediately after the contingency conditions arrive. The technology-oriented strategies that require investment in and installation of equipment will clearly take considerably longer, but these are unlikely for most small urban areas anyway. Any "hard" strategies that involve difficult institutional issues (e.g., special parking actions, vehicle bans) will require more serious planning and review than easier plans. For the most likely range of strategies for small urban areas, roughly six months of preimplementation work will be required, while actual implementation could occur within days.

- Financing and Implementation. While fairly extensive funding (mainly Federal) has been available over the past decade for TSM-type actions in larger urban areas (e.g., FAUS, TOPICS), such funds were either not available to or simply not used as extensively in smaller urban areas. However, those agencies that have identified possible traffic improvement should work closely with their states' departments of transportation to look for possible ways of getting these types of funding support for such actions. Costs for many of these strategies (e.g., temporary bus lanes, on-street parking bans) will of course be relatively small, and may actually help to generate some reserves (parking tax revenues, increased transit fare revenues). Clearly, every effort must be made to select the most cost-effective measures that provide some beneficial travel effects but are within the fiscal and technical boundaries of the local agencies.

- Special Problems. The main problems that agencies will face here will be those traceable to the lack of familiarity with the types of actions under

consideration. Some learning time will be needed for local planners to select cost-effective strategies let alone plan and implement them. Many of these strategies may prove very unpopular, especially if a particular contingency is not perceived as serious in nature. Citizens and firms will be more willing to try to accept new transportation approaches that force them to change well-established patterns if they actually feel that a very real public problems is behind them. Figure IV.6 shows how gasoline demand has declined since the 1979 crisis, which along with frequent headlines of a "glut of petroleum" make it hard to convince the public that shortages are very possible and require planning.

7. Strategies to Improve Energy Supplies

In general, as the discussions in Chapter III outlined, local governments have very little control over fuel allocations and supplies. Both allocation and standby rationing provisions are principally Federal-State concerns, while other fuel supply controls (odd-even gas sale days) are also handled by higher levels of government. If the local agencies are involved in the establishment of a new transit operation, special efforts will have to be made to get a fair allocation of transit fuel, and similar efforts may also be necessary for paratransit operations. However, in general, fuel supply concerns are not within the preview of local governments. They can work effectively with the state to ascertain the effectiveness of state-level actions, and determine when certain provisions should be implemented or removed.

It is also very likely that much of the Federal energy regulatory structure that has developed during the past decade will be greatly limited or dropped entirely. This is especially true in the area of allocation programs, rationing plans, and price control, with more flexible "supply-and-demand" ruberactions in retail markets allowed to occur. In such a world if an urbanized area wanted to assure that fuel supplies is for its transit system would be adequate in an emergency, it would have to compete in an open market for such supplies, and look into expanded storage facilties.

8. Conclusions

The previous sections have briefly reviewed the types of energy contingency strategies most relevant to small urban areas. In reality, very few of

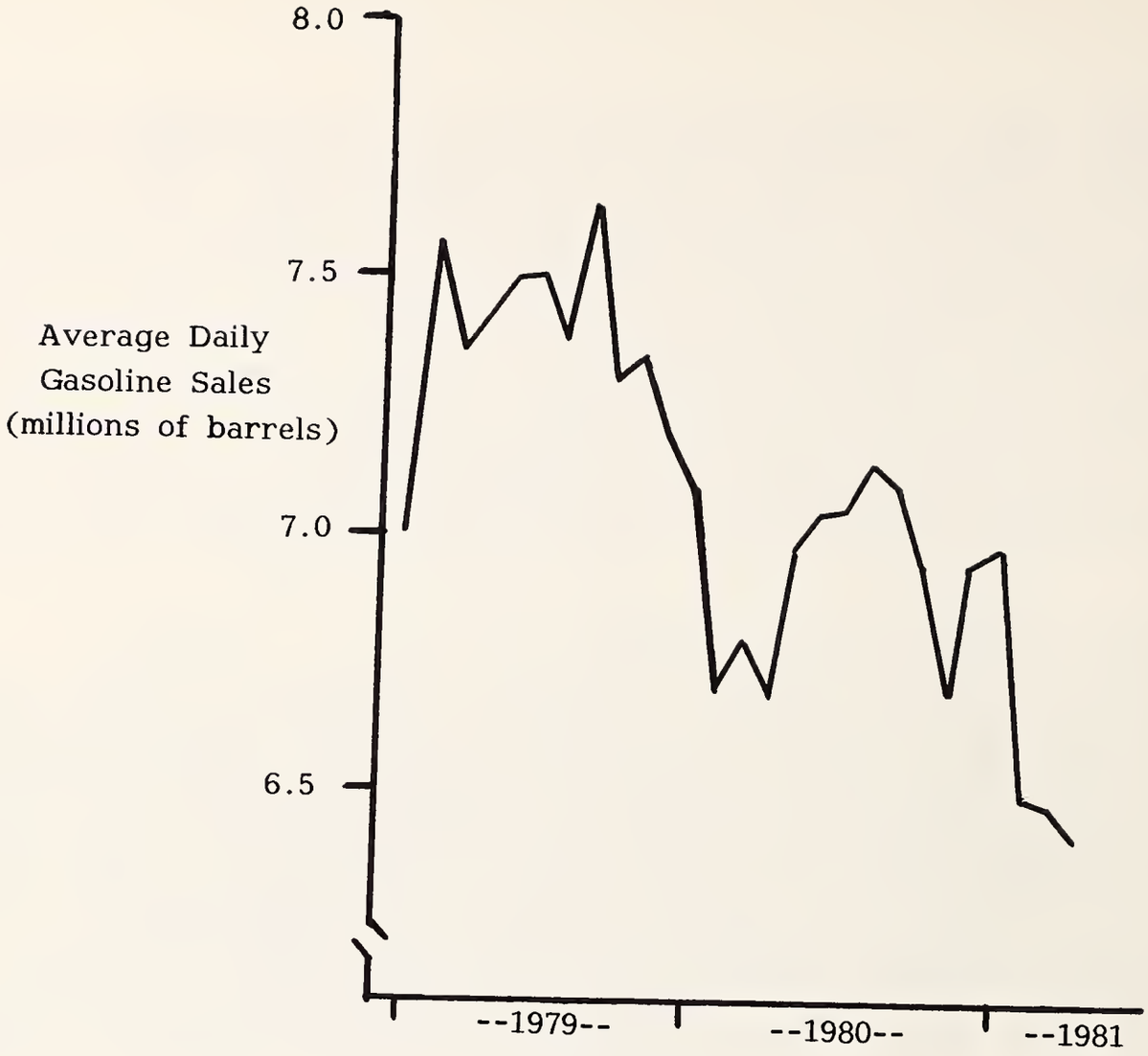

FIGURE IV.6
GASOLINE DEMAND OVER 1979-81 PERIOD

those may be planned for or implemented in such areas, although many energy conservation plans may have already been initiated. Many strategies are relatively expensive, require a sizeable amount of up-front capital investment and eventual subsidy support; others are very inexpensive and are virtually costless in terms of required government expenditures. Clearly a considerable amount of trade-offs have to be reviewed, often in the context of competing local goals (e.g., low fares/high deficits vs. more pay your own way) transit planning. These and related issues, conclusions and recommendations are presented in Chapter V.

CHAPTER V

SUMMARY AND CONCLUSIONS

1. Are Contingencies Likely to Occur

The experiences of the past decade clearly demonstrate how difficult it is to predict what will happen to petroleum supplies and prices. The international situation, particularly in the volitile Middle East, has been the principal cause of the two serious petroleum crises in 1973-74 and 1979. The greater the nation's dependence on foreign sources of oil, the greater the likelihood and severity of energy shortfalls. Hopefully through conservation measures in all sectors, the nations so-called energy/gross domestic product ratio (1,000 BTU's per constant dollar of national output) can be reduced from its presently very high rate of rought 45.0 to figures that are somewhat closer to the much lower values of 27-28 in Japan and Western Europe (2). Recent reviews of the rate in growth of the nations Gross National Product (GNP) and energy use has shown that since the 1973-74 petroleum embargo, the energy growth-to-GNP growth ratio has fallen enough to project that 1990 energy use could be as much as 20 percent below what it would have been if energy conservation and greater efficiency had not reduced this energy ration (29). Figure V.1 demonstrates how the nation is projected to increase energy usage by 11.8 percent from 39.0 to 43.6 million barrels per day of oil equivalent (MMBDOE) from 1980 to 1990, but with a 16 percent reduction in petroleum usage. The transportation and residential sectors will actually be using less energy of all forms due to major conservation efforts. Obviously these are only projections, and they depend on large increases in coal and nuclear energy production and use that may not be realized. However, they do reflect the fact that such energy future are clearly possible and attainable.

However, while no one can clearly predict what the actual likelihood of a given drop in energy supplies occurring at any time, there is general agreement that petroleum shortfall conditions, including ones considerably worse than in the previous crises, will very likely occur during this decade. Therefore, it is definitely important that all energy-intensive sectors, including transportation, prepare themselves for this type of crisis while simultaneously looking for

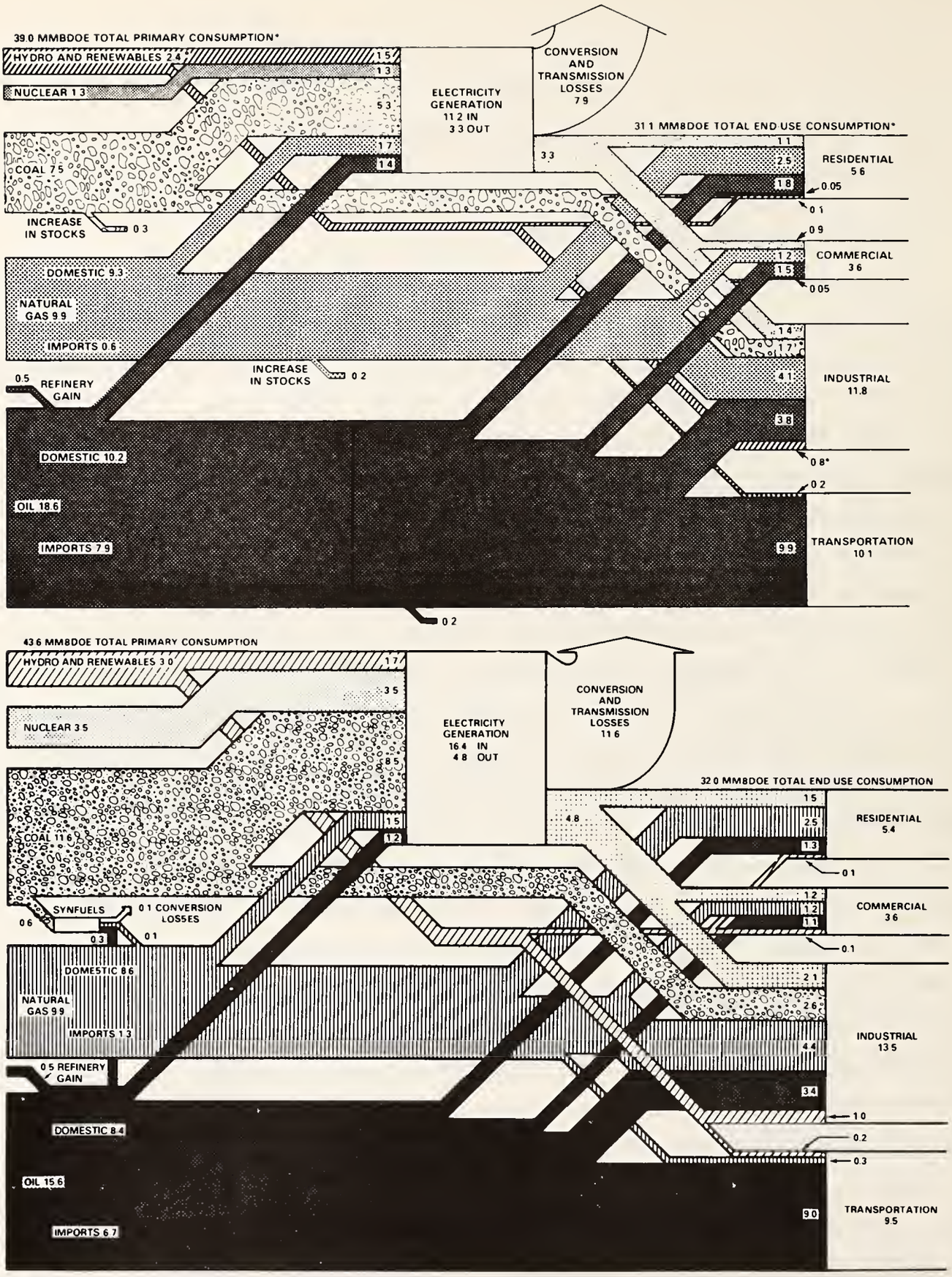

FIGURE V.1
U.S. ENERGY SOURCES AND USES IN 1980
AND PROJECTED 1990 LEVELS
(MILLIONS OF BARRELS PER DAY OF OIL EQUIVALENT)
(SOURCE: REF. 29)

ways to increase energy conservation. There are many potential scenarios in various analyses that include a fairly sudden and severe drop in petroleum supplies. Whether such "worst case" conditions will ever arrive cannot be determined, and possibly should not be the dominant focus of local contingency plans. However, it is clear that some planning is needed, and that there is a role for local governments.

2. The Special Situation in Small Urban Areas

Discussions in Chapters II and III on the nature of personal travel in small (< 50,000 population) urban areas demonstrated that they are particularly vulnerable to petroleum shortfalls due to their intensive auto use and general infamiliarity with the usual travel alternatives, especially conventional transit. They also usually lack the type of regional MPO-type governmental structure that can help coordinate contingency plans among local jurisdiction. The review in Chapter IV of the typical array of contingency strategies highlighted the specific financial, institutional, political and related transportation issues associated with each strategy when applied in small urban areas. It was clear from the start that it was impossible to devise a universally acceptable and transferable group of strategies for these urban settings. The specific conditions in each area, including land use, recent economic trends, commercial and residential density, and present experience with conventional transit and paratransit operations were all important factors in the selection of a basic approach to energy contingency planning. However, while there is no such entity as the "typical small urban area," there were some consistent patterns that frequently appear in such areas. These characteristics set them apart from the larger urban centers that have received most e contingency-related attention in recent years. These characteristics include:

- a lack of extensive transit service and very limited use of and experience with such modes within the community;
- a lack of experience with energy contingencies, as few areas were really hit that hard during the previous two shortfalls;
- relatively little expertise and human and financial resources in the areas of transit/paratransit planning and operation, advanced traffic management and other TSM-type actions, and related contingency planning skills; and,

- a feeling that there was very little that could be done by local officials to really effect the course and impacts of an energy contingency.

This combination of factors essentially leaves the local planners with a fairly limited array of feasible, cost-effective strategies. The expansion of existing transit services or the creation of auxiliary operations were both reviewed and showed some promise. However, they assume a willingness of local officials to seriously consider options that have frequently been shown to be expensive and to require considerable up-front expenditures. These strategies also need special transit planning and operating skills which are generally lacking in these areas. The route structures of existing transit services typically do not result in peak operating efficiency and, have often not been revised to reflect changes in land use. To start a system from the ground up asks even more of these agencies. While local governments can get financial and technical assistance from higher levels of government, they are still left with many new responsibilities that expend scarce local funds on services that the areas' citizens may not think are worthwhile.

3. The Principal Focus of Small Urban Area Strategies

While these discussions are not meant to dismiss the possible expanded role of conventional transit, it appears more likely that various paratransit options hold considerably more promise in the small urban setting. Further, the role of the relevant local government agency may be a fairly passive one, with many of the most effective responses to contingency conditions actually carried out by the private sector (mainly employers) with only limited input from government agencies. The ridesharing programs that focus on the journey-to-work and related business trips that use roughly 40 percent of the vehicular fuel in urban areas are very cost- and energy-efficient actions. These plans have been able to identify and work with local conditions rather than trying to make them conform to travel methods in larger, denser areas. Many of these actions will actually occur without any ogvernment assistance. However, a carefully structured plan to "sell" the benefits of and need for various actions (ridesharing, four day week, etc.), along with some useful "how to" information, will clearly help to increase the amount of such voluntary activity.

There is some room for these smaller local jurisdictions to make effective, low-cost moves to try to support mainly private sector responses to shortfall conditions. These would include such actions as:

a. finding available, underutilized lots for park-n'-ride and carpool/ vanpool staging areas;

b. looking for clear-cut traffic "bottleneck" situations where relatively simple preferential lanes or streets could provide a time savings for high-occupancy modes and/or improve general traffic flows;

c. seeing what they could do within their own government operations to reduce travel and increase transit/paratransit use;

d. acting to remove at least temporarily any regulations that would prevent the development of new transit/ paratransit operations, while still providing some overview protection of the public interest; and,

e. working with local transit/paratransit groups to assure that proper allocations are achieved, that sufficient fuel storage space is available, etc.

4. Remaining Areas of Concern

This report has briefly touched on the major energy contingency issues involved in small urban areas. It did not pretend to provide the types of detailed technical information that local governments would need to plan and implement such strategies (e.g., how to set up a contra-flow bus lane on a two-way arterial). Such material can be obtained from State and Federal transportation and energy agencies and other related organizations (TRB, AASHTOA). Some attention needs to be given to these more technical materials to assure that they reflect in some way the special needs of small urban areas. In addition, the issue of goods movement modes (mainly trucking) and their ability to carry out their essential functions in an energy shortfall has not been addressed here. Moreover, goods movement issues have not sufficiently covered in any energy contingency forum, and they deserve and need more direct attention. The issue of local controls over intercity travel and modal choice, and how local governments can play a role there must also be addressed.

Since the crisis of 1979 and the associated rise in prices, fuel prices have stabilized or actually fallen in constant dollars while the world talks of an oil glut. Such a national and international situation can make it difficult to get forces mobilized at any level of government to fend off the problems of another energy crisis. The fact that crisis conditions appear to be required to force the hand of decision-makers is particularly true at the local governement level. The problems that many areas had in 1979 and 1973 are still clear enough in many minds that the need for timely planning is widely recognized. However, one of the things that this study has tried to show is that a planning and regulatory gap exists in the contingency planning field, mainly due to a concentration on large, more transit-oriented urban areas. Many strategies aimed at those areas simply do not apply to smaller areas that are generally poor candidates for local conventional transit. More attention needs to be given to the kinds of travel problems that smaller urban areas will face. This transportation planning gap has been highlighted elsewhere as a general problem for the field (e.g., 30), and the present study has tried to show that this same lack of attention on small urban/suburban areas has been extended to contingency planning. Hopefully the material presented in this document (along with the special handbook for local governments presented in Appendix C) will help to solve some of these problems or at least highlight those that remain.

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APPENDIX B

SOME ISSUES ASSOCIATED WITH THE USE OF SCHOOL BUSES FOR EMERGENCY LOCAL TRANSPORTATION SERVICES

BACKGROUND

The use of school buses in existing or auxilliary transit systems to transport the general public is one possible way to provide for the transportation needs of a community during an energy crisis. Just such a plan was implemented, for example, in Dade County, Florida in June 1979 when an independent truckers' strike quickly created a gasoline shortage. Ridership on that area's Metrobus System rose dramatically as more and more people got out of their cars due to the gasoline shortage. Metrobus officials negotiated with the school board to allow the use of school buses to expand system capacity. The program was implemented, and over a four-day period eight school buses made a total of 53 transit route trips, transporting 1150 passengers. Unfortunately, the net cost of these services was almost 8 per passenger, 75 percent of which was for insurance payments. However, the project was deemed successful, as it did help provide for the needs of the community during a crisis situation.

Similar programs could be implemented in other cities around the country in the advent of a fuel crisis. These programs could function at a much lower cost if arrangements could be made well in advance of the actual contingency, particularly with the relevant insurance companies. Using school buses as part of a transit bus fleet in times of emergency should therefore provide a quick, low-cost solution to an area's transportation problem. Cooperation between the school districts and the local transportation authority is essential in implementing this type of service, cooperation of the school teachers union and bus drivers union would also be needed. In order to coordinate the necessary programming, a central steering committee should be probably established.

TIMEFRAME

The central steering committee would direct the implementation of such a project so that the system can be ready on a standby basis when a crisis situation arises. Special clauses would have to be added to the insurance policies of the school bus operators. Various union regulations would have to be revised in case of an energy emergency. All of these measures would clearly have to be taken well in advance of the actual crisis situation. Since it is difficult to predict precisely when a crisis would occur, the necessary preparations should take place as soon as possible. Considering the complexity of the

problems, at least six months of preparation would probably be necessary, and this could be much longer if any of the groups involved does not effectively cooperate.

SPECIAL PROBLEMS

There are a number of issues that have to be resolved before the use of school buses for the city bus fleet can be implemented. These factors are listed below, followed by a brief discussion of each:

a. the conflict between school bus pickup hours and rush hours;

b. legal barriers preventing the use of school buses for other purposes;

c. problems arising because of the physical difference between school buses and city buses;

d. insurance coverage; and,

e. labor union agreements

• Rush Hour Commutation - School Bus Pick-up Temporal Conflict. The heaviest demand for transit occurs during rush hours. During an energy crisis, large amounts of employees will be forced to abandon their cars and look for public transportation alternatives for the journey to work. It is in this time period that the school buses will be needed most, as existing transit vehicles will be filled to capacity. Unfortunately part of this high-demand period overlaps the period during which school buses are being used to transport students to school. A decision must be made as to how to deal with this dilemma. Three possible alternatives are discussed briefly.

1. Use school buses for work trips only when they are not used by the school children. This would make these buses available between 9:00 a.m. and 2:30 p.m. and after 4:30 p.m. From the school's perspective such a solution would be the most appealing one since it does not affect the school operation. However, it would not provide for extra buses during most of the morning rush hour.

2. Appropriate school buses for use during rush-hours and adjust school hours accordingly. Under this option the school buses could be used by the transit fleet during the entire morning

rush hour period. School opening would be delayed to 9:30 a.m. or some later time. After completing their rounds transporting people to work, the school buses would revert to their normal job of transporting the children to school.

This alternative would not be an easy one to implement. Politically this would be a very difficult alternative to pursue. Parents would not like the idea of having to take care of their children for that extra hour in the morning. Teacher unions would also not be very receptive to the idea. In 1977, for example, during the natural gas crisis, a plan was proposed in New York State whereby school would start later in the day to save fuel. It met with heavy opposition from the teachers union. According to New York State Law (which is typical of most states), the school day must be at least 5½ hours long. Starting classes very late could therefore create a conflict with the afternoon rush hours; i.e., school buses would be transporting school children back home and would be unable to join the general bus fleet in time for the afternoon rush hour. The Commissioner of Education could suspend the 5½ hour minimum daily requirement and add on additional school days at the end of the year, but this would only be done in an extreme emergency.

3. Rearrange school bus routes so that fewer buses are needed by the school children. Such a plan would involve lengthening each bus route and requiring more children to walk to school. This could be done by increasing the maximum allowable walking distances for pupils. The state of Texas currently provides financial assistance for transit use to all students living more than 2 miles from their school. By increasing this distance more school buses would be available for the general public.

From an equity standpoint, a better approach might be to equalize the walking distance of all students. Currently in many school districts, children transported by bus have very short walking trips to the bus stops while those who live near the school walk up to two miles. Lengthening students' walktrip to the bus stop would provide for the same service with fewer buses, thus freeing some school buses. A study was done in Arlington Texas where such a plan was proposed. The bus stops were called transportation centers and were located at strategic points. A program with maximum walking distances of 2 miles for all students was found to free 18 buses.*

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*North Central Texas Council of Governments. A Metropolitan Transportation Plan for National Energy Contingencies (August 1977).

The whole issue of overlapping of school bus pickup hours with rush hours is only a problem during the school year. If an energy crisis should occur during the summer months at a time when the school bus fleet is under-utilized (as was the case in Dade County, Florida), then no such problem exists.

- Legal Barriers Preventing the Use of School Buses. In certain states there is specific legislation banning the use of school buses for all other purposes. For those states, repeal of such laws is the first step in an energy contingency plan for using school buses. In addition, for those school districts which own their school buses, there frequently are other legal barriers. In New York State, for example, where many localities have school districts that directly own the school buses, they are not allowed to use them for any other purposes. In some localities school bus operations are contracted out to a private operator. The terms of these contracts would determine the permissible use of these vehicles. According to the terms of the contracts in much of New York City, for example, the school buses could be used for other purposes.

In states where using school buses for other purposes is illegal, there may be some resistance to modifying these laws. Many education administrators feel that the public's perception of school buses must not be allowed to change because of safety concerns. Currently, when an auto driver encounters a yellow school bus on the road, he responds with extra caution, knowing that children can be careless pedestrians. However, if the public is led to believe that school buses also transport adults, then the driver will not respond with the same amount of caution when he observes a school bus.

- Physical Difference Between School Buses and Conventional Buses. There are certain mechanical differences between school buses and city buses which lead to differences in operation. One such difference is automatic transmission versus manual transmission. There are also variations in the size and shape of the two vehicles. These discrepencies lead to a feeling of apprehension among the school bus owners/operators over the operation of their vehicles by those unfamiliar with them (e.g., city bus drivers). The feeling is that these differences will make new drivers more accident prone than the regular school bus drivers. In Dade County Florida, for example, because of these fears, the school board insisted that the school bus drivers operate the school

buses at all times. Under such an arrangement a system of reimbursement must be set up. It is most likely that other school districts would take the same position and insist that their own drivers operate the school buses at all times.

The absence of fare collection boxes on school buses means that some other method of fare collection must be devised. If portable fare boxes are available, they could be installed. Otherwise substitute devices would have to be found.

- Insurance Coverage Issues. Insurance rates in New York State, to provide some perspective, are 5 to 6 times higher for city buses than for school buses. Currently school buses used to transport school children exclusively are not insured for other trip purposes. Before releasing these buses for city service, the appropriate insurance coverage must be obtained. A policy for using school buses for other purposes, even for the short term, can be very expensive. The Dade County example showed this very clearly.

In planning for a future energy crisis, the school bus operators should have written into their insurance policies a special clause which would cover the use of school buses for regular transit route operators. If such steps were taken prior to the crisis situation, a good deal of money could be saved. School buses which are owned by the school districts themselves are usually self-insured. Some policy of coverage for these buses should also be made.

- Labor Union Agreements. The cooperation of the labor unions is essential in dealing with an energy crisis. The issue of late school openings and the teachers unions' response was already discussed. The cities bus drivers' union must be willing to make certain changes in their work hours. In Dade County, the bus drivers' union cooperation was only promised after declaration of a state of emergency. The city bus drivers union generally will not look favorably on a plan to allow outside school bus drivers to operate along their routes. In the future, emergency arrangements should be written into the union contracts in advance so that when a fuel crisis does occur, the school buses can quickly and quietly be added to the regular fleet.

CONCLUSION

The previous discussion was presented to demonstrate the types and number of issues and difficulties that can arise when planning a single contingency strategy. The school bus option holds considerable promise, mainly due

to the existence of over 400,000 school buses nationwide that are idle the vast majority of the time. The purchase of buses only needed in infrequent emergency situations, or the maintenance of otherwise retired buses for such emergencies, will generally prove to be an impossible burden to local governments. The school bus option makes this expense unnecessary. Although the problems are clearly numerous and often difficult, they are not unsolvable. It is this type of strategy that smaller urban areas can look to implement, although they will still need assistance in other areas associated with an auxilliary transit system (see Chapter IV for further discussion of this point).

APPENDIX C

ENERGY CONTINGENCY PLANNING GUIDEBOOK FOR LOCAL OFFICIALS, CITIZENS, AND INTEREST GROUPS

NOTICE

This document is diseminated under the sponship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

This document is a comparison to a Final Report of the same name (Grant NY-11-0023), and is intended as a discussion piece for local officials, community groups, and other interested parties.

PREPARED FOR
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IS ANOTHER ENERGY CRISIS LIKELY?

The crisis of cost and price is already upon us. As a nation, we are gradually adapting the efficiency of our vehicles and the fuels used in our industry to the new energy environment. Other steps are underway. Nonetheless, major policy issues, technological problems, implementation lags, and simple cost considerations bedevil these efforts. At the same time, our economy is disrupted by the inflationary impacts of higher energy costs.

The shortage of petroleum supplies has already been visited upon us, once in 1973-74 and once again in 1979. The international political climate and all of its uncertainties could bring on another supply crisis at any time.

HOW SEVERE MUST THE DISRUPTION BE?

Past experience shows that there is a large gap between reality and perception, and that people's perceptions can actually make a mild disruption have the same effect as a serious crisis.

Simple computations can show that "topping off" or panic buying during a 10% gasoline shortfall can make it have the same effect as a 30% or higher shortfall.

We must also remember that a 5% decrease by the oil exporting nations can affect one nation more severely, because they were more dependent upon the particular suppliers or because other nations compete more sharply for the remaining 95% which is even more vital to them.

We must further remember that a 5% decrease in total available supply may mean a higher decrease in the transportation sector, due to higher priorities in home heating, industry, etc.

The "bottom line" is that even small percentages in total shortfall can precipitate a transportation fuel crisis, due to both actual supply levels and consumer reaction.

WHY IS IT A LOCAL PROBLEM?

After all, isn't this what the Federal and State governments are planning for? Don't the larger cities have plans and ways of coping? In some places, isn't this what county-wide planning is all about?

The answer to each of these is "yes" - in principle. However, that planning is often focused on allocation policies and general planning. It does not necessarily show an awareness of regional or local differences in sufficient detail.

It is a local problem because it is local citizens who will have difficulty in getting to work, in making necessary trips, and in obtaining vital services.

It is a local problem because those citizens will expect their local government to help, because the local facilities are under local control, and because

they may well remember (and act on) local inaction more than inaction on higher, more remote levels of government.

It is a local problem because any impacts of an energy crisis on local business most directly affects the local economy.

BUT HOW MUCH CAN THE LOCAL GOVERNMENT DO?

Indeed, one might ask how much it should do. Many jurisdictions are under strong pressure to keep taxes down, and to not get involved in new programs.

In terms of advance planning, the jurisdiction may wish to consider the following actions as a minimum:

- review the State and Federal allocation schemes, to assure that they are relevant and meet local needs (as long as such regulations continue to exist--many are schedules to be dropped);
- inform the State and Federal governments of major institutional barriers for which their prior action may be required (e.g., waive of State Education Department restrictions on non-school uses of school buses);
- provide a forum for local business and community groups to discuss their anticipated problems, their own plans, and their needs for governmental support; and,
- make a conceptual commitment to support those services, actions, and programs which decrease automobile vehicle miles travelled (VMT) or the related fuel consumption and/or maintain or increase the person miles travelled (PMT).

Each of these requires little in the way of financial commitment, but can have significant benefits.

For those jurisdictions which are willing to make a greater financial and planning commitment, specific programs to improve transit ridership, encourage carpooling and vanpooling, decrease congestion, and spread demand where appropriate may be desired.

IS IT REASONABLE TO PLAN IN ADVANCE FOR AN ENERGY CRISIS?

Unfortunately, one cannot easily say "yes" to this question.

Certain planning can and should be done. Certain actions with long-term benefits can and should be taken. However, there are certain options which could prove valuable in an energy crisis but which many parties concerned may find undesirable for a variety of reasons. These may include:

- franchising extra bus routes and taxi services in a community;

- allowing community-owned school buses to serve in competition with other services;

- reserving large sections of parking lots for car pools only at train stations, shopping areas, and other sites;

- encouraging private taxi and jitney services, perhaps using available private autos and vans, with appropriate special insurance which is not currently available to cover added liability; and,

- rescheduling the school day or the school week to take greater advantage of the bus fleet.

The fact is that many parties - government, the Chamber of Commerce, transit operators, private individuals, unions, taxi operators, etc. - have "positions" which cannot easily be modified under hypothetical circumstances, but only under real ones. In realistic advanced contingency planning, this must be taken into account.

GIVEN THIS LIMITATION, HOW CAN WE GO ABOUT ADVANCE PLANNING IN AN ORDERLY WAY?

Even when it is not part of the local jurisdiction's role to immerse itself in transportation, it seems appropriate to consider the following:

- realize that many people will not really be concerned until the crisis strikes;

- ask "What do people use transportation for?" and "What services should government be providing in any case?";

- recognize that good planning is also good energy planning in many cases, so that two or more functions are served concurrently;

- know where information is available, and be ready to use it; and,

- review all candidate actions for the ways in which they would limit or support response to an energy crisis.

WHAT TYPE OF PLANNING IS GOOD ENERGY PLANNING?

Case studies are perhaps the best indicator of the successes that can be achieved:

- One community, recognizing the value of park-n'-ride facilities, is encouraging its State to build facilities near the highways which pass through its jurisdiction, to serve local residents.

- One large firm, recognizing the value of the land around its buildings, has encouraged carpools and vanpools simply to keep its parking lot size down, thereby saving millions of dollars.

- One community is encouraging a "mini-mall" of individual stores, structured so that commuters must pass through the area to and from the train. This not only gives the stores exposure and activity, but also assures activity in the parking area, hopefully mitigating security problems in both areas.

- Another community is encouraging cluster development, which can have social and economic advantages, and also has the advantage of aiding and encouraging group formation.

A work of caution: the advantages of ever larger urbanization are not clear, due to longer trips and more congestion, despite less auto dependence and greater transit usage. The trade-offs are more complex than they would appear initially.

WHAT PERSON-TRIPS ARE MOST LIKELY TO BE IMPACTED?

The most immediate need is clearly the work trip. It is this trip which accounts for the "peaks" in the daily travel, and puts the most burden on the available physical capacity - the roads and the transit vehicles.

School trips might follow as a close second, although most communities are served by a rather highly occupied bus system. Significant efficiency improvements could not be anticipated without decreasing the trips per week (i.e., school days per week). Modifications in the school trip (hours, etc.) might provide needed bus capacity for other trip purposes in critical hours.

Discretionary trips by auto are a likely victim of a fuel crisis, but this is not necessarily bad. Packaging of several trips into one, pooling with friends, and simple foregoing of unnecessary trips can prove to be a significant energy saver.

Shopping trips can be affected, especially by adjusting where shopping trips occur. Decreases in discretionary trips might well have an adverse impact on businesses, but many shopping complexes are not overly concerned because they are built around a vital trip--food shopping at a major supermarket--or because they are a self-contained "world" of opportunities, a modern enclosed mall or an older downtown.

Health care and related trips are infrequent enough to be no special problem, except for certain groups who would have historically faced the problem of being autoless or with limited access, such as the elderly poor.

Personal recreation and social trips to town facilities, recreation, social calls, theaters, restaurants, and so forth are a special topic, and must be reviewed consistent with the jurisdiction's own lifestyle and priorities.

WHAT DOES THIS MEAN? THAT THERE IS NO PROBLEM?

Not al all. However, it might be summarized as follows:

- the work trip is the biggest problem, because it represents so many individual trips and is now rather inefficient. It must be addressed in detail;

- the business community is more concerned with the impact on the budgets of their customers, rather than their mobility. Many feel that shopping center configurations, malls, downtowns, and other clusters give good opportunities for efficient shopping - if the customers can afford it; and,

- there are other trips which must be serviced, but they are much more difficult to organize or meet with any government program. The discretion and common sense of individual citizens is the main strategy in this setting.

Actually, one can make a good argument in the last case based upon a "critical mass" of riders for transit or paratransit. Most communities face the problem of special user groups - the poor, the elderly, the teenagers too young to drive and unable to reach recreational facilities, the persons who keep a second car only for occasional trips, and so forth. In some cases, these groups present social, moral, or health care problems which may be very dependent on their transportation problems.

It might be desirable to identify these various groups and then identify the transportation needs of each (teenagers to social, recreational, and community centers, for instance), and then follow that with a transportation system built on those needs. However, this is a problem which is not special or unique to the fuel crisis.

WHAT CAN BE DONE ABOUT THE WORK TRIP?

The basic rule would seem to be "put more people into fewer vehicles." The secondary rule would then be "avoid congestion."

Existing transit capacity is very limited in most places, and would quickly be filled to its limit in the sort of crisis under consideration. The additional measures which would be useful include:

- encourage carpooling and vanpooling, remembering that employer-based efforts have proven more successful than government-run programs. Perhaps the government role might be limited to providing information and some passive facilities (parking lots, etc.);

- identify locations for park-n'-ride facilities, including sections of shopping areas, church parking lots, etc. which are not used to capacity during the week, but which could be marked for park-n'-ride use if the owners were willing;

- permit additional franchises of bus routes linking key employment concentrations, shopping/employment areas, and residence and parking concentrations. These may have to be on some experimental or renewable term basis;

- identify the methods by which people may enter the bus transit, taxi, jitney, and other carry-for-hire business within the jurisdiction, and work to assure that the process is not cumbersome, while still protecting the public interest;

- remedy any insurance problems which might limit availability of space for park-n'-ride facilities on private lots, entry into transit and paratransit service, and even pooling;

- reserve certain facilities for transit, paratransit, and pooled vehicles. The facilities might be streets, lanes, parking areas, etc.;

- supplement these actions with support of bicycles and mopeds, including appropriate storage areas.

This is in response to the basic rule, "put more people into fewer vehicles."

The secondary rule, "avoid congestion," can be achieved by a number of means, including:

- spread the peak travel period by staggered work hours, 4-day work weeks, and other means so as to make transit, paratransit, and roadway space available for additoinal service. Some cities have scheduled different starting times by industry, and some government agencies have compressed work weeks; and,

- achieve the higher vehicle occupancies addressed above.

The advantage of reducing congestion is two-fold: (1) the road space and vehicles are available for use again and again; and, (2) any given trip is faster, smoother, and less energy consuming.

A good example can be set by the local governments' own programs in carpooling, parking priorities, vehicle purchases, and staggered work hours. The number of governmental workers in the key area is usually quite significant.

WHAT OTHER NEEDS DESERVE SPECIAL ATTENTION?

The earlier list of trips was very suitable for the longer term of the crisis. However, immediate attention must be paid to:

- fuel supplies for vital services - police, fire, ambulance, transit, paratransit. These must be considered on two levels:

* consistent with past use
* consistent with expanded and new service needs, particularly in transit, paratransit, and even pooled operations;

- fuel supplies for those who operate such services - so that the necessary people (operators, maintenance crews, etc.) can operate the systems. This was too often overlooked in the past.

- fuel supplies for special groups - such as certain handicapped and medical needy groups.

SHOULD LOCAL BUSINESS BE MORE INVOLVED?

The present business concern seems to be more with customers having the real and discretionary income to spend, rather than with their mobility. Of course, in new location decisions, some access considerations are quite important.

If a mobility crisis does arise, sites which have a diversity of opportunities have a special advantage. This is why malls, downtowns, and local shopping centers can be somewhat immune.

However, trips can be suppressed by a fuel crisis. Bus routes along key routes and amongst major concentrations would be good advance planning. Businesses would be well advised to know the origins of their present customers (perhaps by zip code or major intersections) and plan for some "what if" problems - what if 20% of these people couldn't make the trip, etc.

Local business can also contribute by making it resources available for community service - parking lots for park-n'-ride, space for advertising pooling concepts, surveys of potential transit markets.

Probably the single most important role for employers is to assist their employees in forming carpools and vanpools. Employer-based ridesharing programs are inexpensive, are trusted by employees, and have repeatedly been shown to be successful.

WHAT SHOULD BE NEXT?

Let the first step be the reading of this brochure. Without significant investment, copies can be sent to key local groups for their comment and reaction.

The next step should be one or more local meetings...what do people want the local government to do?...what do they plan to do themselves?...what obstacles should be cleared for them?

Ask yourself a key question...what would you expect to see done if your community had:

... 25% less gasoline for 4 weeks?

... 25% less gasoline for 3 months?

... 25% less gasoline for the next 1-2 years?

What would be different if the number were 40%?

Lastly reivew the checklist below:

AN AWARENESS CHECKLIST

1. Who franchises the local bus routes, if there are any?

2. What permits or franchises are needed to open a local taxi business? How may it operate? How many agencies does it have to deal with?

3. How much of the local population works locally? How much commutes to another area? What is the revenue breakdown for these groups?

4. How much of the local economy depends on visitors or travellers to the area?

5. Can the local jurisdiction restrict any local parking lots to "carpool only?" Why or why not for each one?

6. What authority does one need to establish a transit/ paratransit/ carpool lane on a local road?

7. What risk or liability is taken by a shopping center owner who makes 25% of his lot available for park-n'-ride or commuter parking on weekdays?

8. Can the local school bus fleet be used for local revenue service? Why or why not?

9. Is a fuel allocation available for a new transit service? An expanded service? How about a taxi service?

10. How do the local firefighters get to the firehouse? How about other vital services? Is a priority system at local gas stations legal?

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